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M. J. Dorsey.

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Vol. 14 MAY, 1925 No. 5

ENTRIES 4002–4962

AGRONOMY

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(See also in this issue Entries 4106, 4128, 4132, 4133, 4134, 4172, 4186, 4208, 4218, 4223, 4224, 4225, 4249, 4285, 4294, 4299, 4302, 4308, 4318, 4319, 4326, 4328, 4334, 4335, 4339, 4340, 4341, 4343, 4344, 4345, 4346, 4347, 4348, 4354, 4355, 4366, 4368, 4382, 4387, 4388, 4752, 4754, 4776, 4789, 4792, 4813, 4814, 4822, 4823, 4824)

CROP SCIENCE (ARVICULTURE)

4002. ANONYMOUS. **A trial of cocksfoot.** Canterbury [New Zealand] Agric. Coll. Mag. **5**: 73–75. 1924.—Selected plants from an old-established pasture on poor stony soil, and from a hill-side pasture, have been planted out for further study. The opinion is expressed that certain strains of Danish cocksfoot on the New Zealand market have been selected for seed production.—*H. H. Allan.*

4003. ANONYMOUS. **Can seed be over-cleaned?** Amer. Fertilizer **61**[11]: 41. 1924.—A form of cleaning which sometimes may be both financially wasteful and technically wrong is the removal of the small seed clusters in the case of mangel and beet and the separation of the small seed of indigenous grass or clover plants, thus eliminating the more hardy strains. —*George H. Dungan.*

4004. ANONYMOUS. **Changing the shape of the sweet potato.** Amer. Fertilizer **61**[5]: 46. 1924.—The sweet potatoes produced with 8% potash fertilizer were ½ inch thicker and ½ inch shorter than those produced without potash.—*George H. Dungan.*

4005. ANONYMOUS. **Cyprus flax.** Cyprus Agric. Jour. **19**: 116–118. 1924.—The author discusses the shipment of a few bales of Cyprus grown flax to a Dundee, Scotland, firm to ascertain its quality. The report of this firm indicated that it is inferior to Russian flax and only suitable for heavy sizes for canvas purposes. The firm's description and criticism of the flax is tersely stated under 2 heads: (1) The flax is short in staple and in fibre strand; (2) the fibre is hard and bare, and lacks in spinning quality.—*W. Stuart.*

4006. ANONYMOUS. **Mauritius at Wembley.** South African Sugar Jour. **8**: 695, 697. 1924.—Some data relative to the sugar industry and history of its growth in Mauritius are

given. The principal variety of cane at present grown on the island is the White Tanna, introduced about 1900. Other principal varieties cultivated are D-74, locally known as DK-74, and introduced from Demerara; 55P, 131P, and 33P, locally raised seedlings; and a very large number of seedlings of local and imported origin cultivated on estates. Among the more promising seedlings at present coming under cultivation are D-109, R.P. 6, R.P.8, R.P.73, 33–231, 55–1182, B6450, and P.O.J.213.—*Nellie E. Fealy.*

4007. Anonymous. **The Maxwell patent crusher-shredder. An improvement of the milling system.** (Translated from the Dutch newspaper, Mataram, Sept. 5, 1924.) South African Sugar Jour. **8**: 801, 803, 805, 807. *5 fig.* 1924.—The Maxwell patent crusher-shredder recently withstood the test of the criticisms of experts at the "Padokan" Sugar Factory in Java. The inventor, Dr. Francis Maxwell, is also the inventor of the "Best Crusher-Rollers" and recently patented the Maxwell Segmental Roller. The crusher-shredder consists of 2 crusher-rollers, the teeth differing in shape from those of all existing rollers used in crushers, and also a shredder roller, which acts against the top roller or crusher-roller. The cane stalks are fed in as in the ordinary crusher-rollers, and then, passing through the toothed crusher-rollers, they are so crushed and broken by the latter that the resistant hard rind is partly disintegrated and the core of the cane exposed. The broken cane is then shredded by a rapidly rotating shredder roller and combed into long strips. Other advantages are that no trash turner beam and plate are necessary; there is no formation of powder from the trash, and no preliminary machinery is required, as the machine does everything itself without the aid of other devices.—*Nellie E. Fealy.*

4008. Anonymous. **Verslag over het jaar 1923. [Report of the year 1923.]** Verslag Dept. Landb. Nijverheid en Handel Suriname **1923**: 1–116. 1924.—A report of the various divisions of the Department of Agriculture in Surinam is given.—G. Stahel states that orange growing, especially along the Commewijn and Surinam rivers is considerably increasing. Coloring green fruit with ethylen gas was successful. Cacao growing is decreasing on account of diseases and low prices. Dying off of cacao plants did considerable harm, due to a disease of the wood parenchyma.—In cacao breeding it is the intention to obtain hybrids which possess the fine qualities of the Criollo and the strong growth and rich productivity of the Forastero as mother plant. Such hybrids can be vegetatively propagated later on. Immunity against disease is also to be observed. Liberia coffee is being selected for quality and quantity of production. A start has been made in cotton breeding. E. van Drent states that *Acacia tortuosa* and *Pithecolobium unguis cati* are suitable for hedges along large areas. Citrus growing does not succeed on heavy clay soil. *Phaseolus Mungo* proved to be good for green manuring but did not produce much seed. *Erythrina glauca* is not a suitable plant for shading coffee but *E. umbrosa* is recommended for this purpose. *Enterolobium* grows quickly in 1 year and the plants do not cause much damage to coffee plants. H. van Waveren states that vegetables are being tried for export on Demarara. Tomatoes, celery, lettuce, beans and especially New Zealand spinage did well.—L. Gonggrijp gives a statement concerning various forest concessions, management of the Suriname forests, collection of herbarium plants, and other matters.—*J. C. Th. Uphof.*

4009. Allen, Paul W. **Inoculation in the growing of legumes.** Washington [State] Agric. Exp. Sta. Popular Bull. 122. *1–16. 6 fig.* 1923.—Results are given of the use of cultures for various leguminous crops in Washington, followed by directions for the use of cultures.—*F. D. Heald.*

4010. Arthur, B. M. **Variety trial with potatoes at Orange.** Agric. Gaz. New South Wales **35**: 618. 1924.—The variety trials referred to were conducted by the author in conjunction with A. V. Tonking, Cargo-road, Orange. Lack of rain during January and March, when the plants were flowering, more or less interfered with the experiment. The crop was planted in November in rows 33 inches apart and 15 inches apart in the row. The following varieties gave the best yields: Late Manhattan, Langworthy, Up-to-Date, Early Manistee and Early Manhattan. Late varieties were less injured by lack of rainfall than were early varieties. Late Manhattan produced 154 bushels per acre while Early Manhattan yielded only 71 bushels.—*W. Stuart.*

4011. Aumüller, Fritz. **Neuzeitlicher Getreidebau. [Modern grain culture.]** Part

I. Rye and wheat culture. *96 p. 39 fig.* 1922. **Part II. Barley and oat culture.** *109 p. 55 fig.* F. P. Datterer & Co. (Sellier). Freising-München, 1923.—A discussion is given of the economic significance of grain culture to Germany, showing the necessity for the grain districts of West Prussia and Posen to increase their yield. The author has had practical experience in private and public grain investigations. The book is written in popular style without scientific terms and is well illustrated.—Part 1 deals with the culture of grain crops. The species and varieties of winter rye and winter wheat, the necessity of good seed, climatic and soil factors, fertility, fertilizers, threshing, growth disorders, and yield are all discussed. Spring rye and wheat are also discussed to a limited extent, as well as the comparative value of wheat and rye.—Part 2 deals in a similar manner with summer and winter barley, oats, and winter oats. Corn and millet culture are also treated to a limited extent.—*J. W. Taylor.*

4012. Bailey, C. H. **Chemistry in the cereal industries.** Indust. and Eng. Chem. **15:** 900–901. 1923.—This is a general discussion of the chemical composition of wheat flour and bread dough. The response of yeast to modifications in its environment with special reference to the baking of bread is also discussed.—*Henry Schmitz.*

4013. Böltz, W., C. Reisch and H. Jantzon. **Einsäuerungsversuche aus dem Jahre 1922. (Schluss).** [**Ensiling experiments in 1922 (concluded).**] Mitteil. Deutsch. Landw. Ges. **39:** 831–835. 1924.—This is a report of the ensiling of white clover (*Trifolium repens*) cut before blooming and a comparison of this silage with hay from the same material. The digestibility of both feeds, fed to a wether, was the same. The authors conclude from all trials that when material is placed in a water- and air-tight container there is practically no loss in feeding value. [See also Bot. Absts. 14, Entry 2134.]—*A. J. Pieters.*

4014. Booth, J. F. **Production and marketing of wheat in North America.** Sci. Agric. **4:** 293–300. 1924.—The development of the wheat industry in North America is traced from the earliest white settlements to the present day. Among the earliest references to wheat in the northern part of the continent is that sown in Massachusetts in 1602 by Gosnold. Until toward the end of the 18th century the acreage was very small, confined to the Atlantic seaboard and river valleys, and the wheat almost entirely grown for home consumption. Exports from the U. S. A. increased from 4,272 bushels of wheat and 756,702 barrels of flour in 1822–1823 to 3,890,141 bushels and 2,920,918 barrels in 1852–1853. Following the industrial revolution in the latter part of the 18th century there was a gradual expansion of the wheat industry throughout the middle western states and in what is now Ontario. In the years following 1850 the development of railroads west of the Mississippi and the Great Lakes brought the fertile prairie land under wheat cultivation. In the early days the wheat was marketed on the individual basis and the price varied in different localities. Then followed the establishment of grain exchanges, the one at Chicago being the first. As a result of the opposition of the farmers various coöperative organizations sprang into existence, and latterly wheat pools, all of which aim to keep the marketing in the hands of the producers.—*T. G. Major.*

4015. Burgess, Paul S. **The yield and mineral content of crop plants as influenced by those preceding.** Rhode Island Agric. Exp. Sta. Bull. 198. *1–25.* 1924.—Especially on low-phosphorus, acid soils, crops sensitive to such conditions grew much better after corn than after mangels. The soil after mangels contained more active alumina, and had a higher specific acidity and lime requirement than the soil after corn. There was a tendency for the corn plants following mangels, as compared with those following corn, to absorb larger percentages of the acidic constituents and of iron and aluminum, and less of the more basic elements calcium and magnesium.—*B. L. Hartwell.*

4016. Burleson, D. J. **Why cotton responds so well to fertilizer.** Amer. Fertilizer **62**[1]: 48: 1925.—Phosphoric acid stimulates early growth and fruiting of the cotton plant, and also hastens maturity. A large amount of available nitrogen makes the plant grow rapidly and gives it a dark green color. The nitrogen should be mostly used up in the early part of the season so that the plant will not produce excessive vegetative growth. Potash makes the plant strong and rigid, and also tends to make the plant resist certain diseases, such as rust. —*George H. Dungan.*

4017. Cathcart, Charles S. **Fertilizer inspections in New Jersey from 1880 to 1921.** New Jersey Agric. Exp. Sta. Bull. 368. *1–24. Fig. 1–5.* 1922.—Commercial fertilizer con-

sumption in New Jersey increased from 71,000 tons in 1880 to 163,486 pounds in 1921; during the same time the amount of fertilizer used per acre of improved farm land increased from 29 to 212 pounds.—The author quotes wholesale prices of the essential elements of plant food from 1880 to 1921 and also gives a statement of the character of the nitrogen content and variation in grade of fertilizers during this same period.—*Wm. H. Martin.*

4018. Champlin, Manley. **Methods of making variety tests of rye.** Sci. Agric. **4**: 223–224. 1924.—The difficulty of making variety tests with rye is increased by the fact of its being open fertilized, and thus necessitating the growing of isolated seed plots. To overcome this difficulty it is suggested that each experimental station in the rye-growing district grow an isolated seed block of one variety sufficient to supply all the other stations with seed.—*T. G. Major.*

4019. Champlin, Manley. **Report of the Summer Fallow Substitute Section, Committee on Field Experimentation.** Sci. Agric. **4**: 394–398. 1924.—A tabulation is given of the results obtained from a uniform coöperative project to determine the possibility of growing various crops in rows as a substitute for summer fallow in Western Canada.—*T. G. Major.*

4020. Cross, Wm. E. **[Field trials with different varieties of cane in Argentina.]** Internat. Sugar Jour. **26**: 607. 1924.—As the result of extensive trials the author considers P.O.J. 2725 the best variety as regards yield of cane and sugar, immunity from mosaic disease, easy trashing and transport, and general characteristics as a thick cane.—*Nellie E. Fealy.*

4021. Davis, B. M. **Root-development of Lucerne.** New Zealand Jour. Agric. **28**: 179–180. 1924.—A study to determine the effects of an application of superphosphate on lucerne roots is described. Plants were grown from seed in specially prepared vessels. The experiment was divided into 3 series represented by plants receiving 15, 30 and 60 inches rainfall per annum, respectively. Part of the plants were given an application of 2 hundredweight of superphosphate per acre while the others received none. Plants were examined at 4, 8 and 20 weeks from germination. The results are summarized as follows: (1) The depth of penetration of tap root where fertilizer was applied was less with 30 and 60 inches of rain but greater with 15 inches. (2) The lateral and tap roots were somewhat less in diameter where fertilizer was applied. (3) Fertilizer appeared to increase the root development in the surface soil, except in the 20-week plants. (4) Fertilizer when combined with a heavy or light rainfall had a depressing effect on the total root-production. (5) The efficiency of the roots with 30 inches of rain was not altered by superphosphate but was increased considerably with 15 and 60 inches of rain. (6) Superphosphates affected the germination of the seed adversely.—*H. L. Westover.*

4022. Dewey, Lyster H. **La Produccion de Fibras Vegetales en Puerto Rico. [The production of fibers in Porto Rico.]** Rev. Agric. Puerto Rico **13**: 309–317. *4 pl.* 1924.—Conditions of soil, climate, labor and transportation are favorable for the production in Porto Rico of sea island cotton, sisal, henequen and kapok. The cultivation of these plants and the preparation of their fibers are discussed.—*Author.*

4023. Drăgan, I. C. **Influenţa umflării anterioare asupra facultăţii de germinaţie la seminţele alterate. [Influence of previous swelling on the germinability of injured seed.]** Viaţa Agric. [Bucureşti] **13**: 145–150. 1922.

4024. Farrer, William James. **Letters of William Farrer, wheat breeder.** Written from Lambrigg (Queanbeyan and Tharwa), New South Wales, Australia, to B. T. Galloway and M. A. Carleton, U. S. Dept. of Agriculture, Washington, D. C., in the period from July 6, 1894, to April 3, 1906. Typed in the Office of Cereal Investigations, Bureau of Plant Industry, Washington, 1922.—An insight into the important work of William Farrer in the development of better wheats for Australia, is given by these letters. Selection for rust resistance, an important feature of his work, was begun about 1886–1887, and crossbreeding about 1889–1890. Wheats collected from all parts of the world were tested. Any desirable strains present were selected out, or desirable qualities were recombined by crossing. Most of the work was done by Farrer personally and the intimate knowledge thus gained of types, classes, and varieties of wheat is reflected in these letters, comments on which are scattered throughout the correspondence. Not least important are the detailed descriptions of methods used in crossing, planting, harvesting, keeping records, etc. Milling quality was also kept

in mind in his breeding work, and reports and comments on milling values are included. Most of Farrer's work was done before Mendel's laws were rediscovered. In 1905 he writes, "I am just now in the throes of mastering Mendel's laws, the practical application, however, of which I have been following for about a dozen years, if selecting a number of plants, planting the seeds from each in separate drills, and selecting the drill which produces a uniform type, constitutes a practical application of this theory." The varieties developed by Farrer are now the principal ones grown in Australia and are also being grown in other countries.—*C. E. Leighty.*

4025. Filó J. **Zöldségféléink mütrágyázásának jelentösége.** [**The significance of green manuring.**] Herba **7**[6]: 217–221. *Fig. 1–4. 1924.*

4026. Fiske, Jessie G. **Weeds of New Jersey.** New Jersey Agric. Exp. Sta. Circ. 161. *1–36 p.* 1924.—This circular includes a discussion of the classification of weeds, suggestions on methods of eradication as well as a description of the most troublesome weeds in the state. The various weeds discussed are illustrated.—*Wm. H. Martin.*

4027. Geddes, W. F. **The sugar beet industry.** Sci. Agric. **5**: 101–112. 1924.—The history of the development of the sugar beet industry is briefly outlined. The process of manufacturing beet sugar from the raw to the finished product is described. Experiments to ascertain the possibility of establishing the industry in Manitoba have been carried on since 1917. A low sugar content and low percentage of purity of juice were obtained in all except 1 year's crop. In addition, the average temperature during the growing season is several degrees below the optimum for sugar beet production.—*T. G. Major.*

4028. Hansen, K. **Planteavlen, 1923.** [**Crop production, 1923.**] Tidsskr. Landokønomi **11**: 541–568. 1924.—Numerous statistical tables show the acreage of various crops during 1923 compared with that of 1922. The causative factors controlling the variation are discussed.—*Albert A. Hansen.*

4029. Hellbo, E. **Nogle Kendetegn, hvorved Frö af Rapgraesarterne kan bestemmes.** [**Characteristics by which seed of Poa can be recognized.**] Tidsskr. Landøkonomi **5**: 760–769. 1924.—In the determination of the seed of species of *Poa*, the characteristics of the teeth and hairs of the marginal nerves of the inner palea have been successfully used by the state seed testing station of Denmark. *Poa pratensis* possesses large and wide-spreading teeth on the dorsal nerve of the outer palea; *Poa trivialis* has small, compacted teeth; *Poa palustris* has medium sized teeth slightly bent and possesses a yellow spot on the upper part of the outer palea; *Poa compressa* has a short, open seed, usually a short, stiff rachilla and medium sized, slightly bent teeth; *Poa annua* has characteristically shaped seed and no teeth in the dorsal nerve of the outer palea. The teeth of *Poa* are usually visible through a binocular (× 40) without the pre-soaking formerly necessary.—*Albert A. Hansen.*

4030. Henry, Yves. **Plantes à fibres. Éléments d' Agriculture Coloniale.** [**Collection Armand Colin, Section d' Agriculture. No. 49.**] *211 p. 58 fig.* A. Colin: Paris, 1924.—This work is evidently intended as a handbook of information about fibers which may be produced in the French colonies, all tropical or subtropical. Fibers of the temperate zone, like flax and hemp, are not mentioned.—After a brief statement about the origin and physical and chemical characters of fibers, about 100 pages are devoted to cottons. Kapok and its production and uses are treated and, more briefly, ramie, jute and a few other bast fibers, and sansevierias, agaves, phormium and abacá of the hard fibers. Brief statements about coir, raffia and piassava follow.—The book contains much valuable information and ought to serve a useful purpose, but unfortunately the botanical names, especially of the hard fiber plants, are not all in accordance with the present knowledge of these species.—*Lyster H. Dewey.*

4031. Hinds, Cyril A. **Exhaustion of final molasses in the cane factory at 92° to 94° Brix.** Internat. Sugar Jour. **26**: 370–372. 1924.—Although authorities agree that to exhaust the final molasses in the manufacture of cane sugar, it is necessary to concentrate the low-grade strikes to at least 90° Brix, the author has never found it necessary to concentrate to more than 94° Brix and states that "anything between 92° and 94° Brix exhausts the molasses as far as necessary." His statement is based on 10 years' experience. Besides degree of concentration, 4 things are necessary in exhaustion of final molasses—good clarification, careful

and slow boiling of low-grade strikes, sufficiently low purity of the massecuite, and a sufficiently long time in crystallizers for massecuite to reach the temperature of the air. To bear out his point the author gives the average figures from an actual crop showing Brix, sucrose, and purity of normal juice, final massecuite, and final molasses, and gives the gallons of molasses per ton of cane as 4.36. A table shows the particulars of every low-grade strike included in the averages above mentioned. The author also gives his reasons for believing 93° Brix high enough for a final massecuite.—*Nellie E. Fealy.*

4032. Holm, Alex. **Agricultural census of the colony and protectorate of Kenya 1922.** Ann. Rept. Dept. Agric. Kenya Colony [British East Africa] 3: 1–17. 2 maps. Nairobi. 1923.—This report consists principally of detailed tables giving statistical information of the acreage, production and other pertinent details of the crops produced in the colony, including cereals, beans, peas, potatoes, lucerne, coffee, sisal, flax, sugar cane, coconut, wattle, rubber, cotton, fruit, vegetables and miscellaneous fodder crops.—*Mary R. Burr.*

4033. Hunter, H. **Barley growing.** Jour. Ministry Agric. Great Britain 30: 602–611. 1923.—This is a review of the culture, soil requirements and varieties adapted to the British Isles.—*H. V. Harlan.*

4034. Johnson, E. C. **Thirty-first annual report, for year ending June 30, 1921.** Washington [State] Agric. Exp. Sta. Bull. 167. *1–64.* 1922.—Brief summary reports of experimental work by the different Division Heads are presented. The following are of interest to botanists: (Bacteriology) factors which control the infection of legumes by bacteria, the effect of straw on biological soil processes, and the use of pure culture starters for making cider vinegar by W. I. Nightingale; (Agricultural chemistry) sulphur as plant food, and nutritional studies with wheat by J. L. St. John; (Farm crops) varietal and cultural experiments with wheat, oats, barley, rye and peas, tests of date of seeding of winter wheat, resistance of wheat to bunt (*Tilletia tritici*) and of oats to covered smut (*Ustilago levis*), and forage investigations covering legumes, grasses and sunflowers by E. G. Schafer; (Horticulture) apple rosette, orchard cover crops, fruit storage investigations, and seed potato production by O. M. Morris; (Plant pathology) wheat smut investigations (*Tilletia tritici*) summarizing the work on the spore-load of grain, and control by seed treatments, the foot-rot of wheat in the Spokane Valley, the western blight or yellows of the tomato, and the new diseases of the state by F. D. Heald; (Soils) a study of the effect of soil nitrates on small grains and especially wheat, crop rotations, and the effects of the return of crop residues to the soil by F. J. Sievers; (Adams Branch Station) varietal and cultural experiments with cereals, and soil studies concerned with the problems of dry farming by M. A. McCall; (Waterville Branch Station) cereal and forage studies for the area having about 12 inches annual rainfall by C. E. Hill; (Irrigation Experiment Station) variety tests with alfalfa, time of cutting of alfalfa, cultural tests with sunflowers, variety tests of cereals and studies of seed potato production.—*F. D. Heald.*

4035. Johnson, E. C. **Thirty-second annual report, for year ending June 30, 1922.** Washington [State] Agric. Exp. Sta. Bull. 175. *1–64.* 1922.—Brief summary reports of experimental work by the different division heads are presented. The following are of interest to botanists: (Bacteriology) effect of sunlight on longevity of *B. radicicola* applied to legume seed and effect of various factors on inoculation with legume bacteria by W. I. Nightingale; (Agricultural chemistry) nutritive value of wheat, and sulphur as a plant food by J. L. St. John; (Farm crops) varietal and cultural experiments including rate of seeding, comparative yield of wheat and oat varieties, and a field test of the Turkey-Florence cross that had proved immune to stinking smut, forage investigations including tests of alfalfa, annual and biennial sweet clover, and spacing of sunflowers by E. G. Schafer; (Horticulture) orchard cover crops including a résumé of results reported in Washington Agric Exp. Sta. Popular Bull. 121, fruit storage studies, and seed potato production by O. M. Morris; (Plant pathology) wheat smut, a summary of results reported in Washington Agric. Exp. Sta. Bull. 171, foot-rot of wheat with data on effect of date of seeding, resistance of varieties and results of inoculations, oat smut, including tests of copper carbonate for covered smut (*Ustilago levis*) which showed poorer control than in similar treatments for bunt; cranberry investigations on field and storage troubles of the cranberry, a study of the Rhizoctonia disease of the potato

with tests of periodic planting and seed treatment, the western or yellow blight of the tomato and notes on new or little known plant diseases of the state by F. D. Heald; (Soils) soil nitrate studies, determination of the fertility of Western Washington soils, and studies of the relation of precipitation to soil composition, of the effect of magnesium oxide dust on the soil, and on the fertility of irrigated soils, by F. J. Sievers; (Adams Branch Station) crop and soil studies by M. A. McCall; (Irrigation Station) tests of cereal and forage crops, periodic plantings of Rhizoctonia-infected potatoes and irrigation studies by R. P. Beans; (Waterville Branch Station) variety tests of cereals, tillage and seed treatment experiments with wheat by C. E. Hill.—*F. D. Heald.*

4036. Juritz, Chas. F. **The sweet potato and its cultivation along the southern coast belt.** Jour. Dept. Agric. South Africa **2**: 229–239, 340–352. *6 fig.* 1921.—The evident object of this study was to determine the possibility of utilizing the sweet potato as a basis for liquid fuel. Four varieties were grown (1) Common 6-months, (2) Red-skinned 3-months, (3) Yellow-skinned 3-months, (4) British East African white-skinned. The 6-months kinds are most popular as they transport better. The red-skinned type is the most delicate potato of the 4. Descriptions are given of these 4 types followed by a discussion on cultural practices, and the chemical composition of the tubers or roots. Comparisons are also indulged in regarding sweet potato production in the U. S. A. The average yield per acre of sweet potatoes in the Union of South Africa is stated to be 3390 pounds or 56.5 bushels, while the average production of potatoes is only 2200 pounds or 36.7 bushels. Commercial production areas are mentioned and figures given as to acreages and yields. The storage of the crop and its possible conversion into sliced, dried or powdered product is discussed.—*W. Stuart.*

4037. Keinholz, R. **The effect of high temperatures on the germination and subsequent growth of corn.** Philippine Jour. Sci. **25**: 311–347. *Pl. 1.* 1924.—Some of the notable results of this study are: Air-dry corn, containing 10 to 11% moisture, is killed by exposure to 80° and 90°C. for 25 and 10 minutes respectively, and is injured by exposure to 70°, 80° and 90°C. for 80, 10 and 5 minutes respectively; resistance to high temperatures varies inversely as the water content of the corn at the time of heating; the amount of growth of the seedlings follows, in general, the percentage of germination of the treated and untreated corn.—*E. D. Merrill.*

4038. Keyworth, C. M., and R. B. Forster. **The removal of gummy, oily, and waxy matters from raw cane sugar.** Internat. Sugar Jour. **26**: 546–550. 1924.—The authors found that the gummy, oily, and waxy matters in raw sugars are to a large extent volatile in steam. When a filter press is steamed, therefore, the oily film on the cloth is at least partially removed and the power of filtration restored, but this process can not be repeated indefinitely as its effectiveness decreases with each repetition, and the steam has a scorching effect on the filter cloths. Four experimental filtrations, described in detail, were carried on by the authors: (1) On untreated raw Peru sugar liquor, (2) on treated raw Peru sugar liquor, (3) on untreated washed Peru sugar liquor, and (4) on treated washed Peru sugar liquor. The authors' conclusions follow: (1) The optimum time required for distillation varies with the sugar to be treated, but from 30 to 60 minutes is usually sufficient if the live-steam coil is of suitable proportions. (2) The increase in filtration efficiency is usually about 100%. (3) The viscosity of a sugar solution decreases rapidly as the temperature rises and it is almost impossible to filter 2 solutions and keep them at the same temperature. The best method is to use 2 suction filters heated in a steam oven and connected with the same filter pump. (4) The advantages of the method on a commercial scale are that either raw sugar liquors or partly exhausted syrups can be advantageously treated before filtration; that the decolorizing power of a given carbon is increased because the carbon is not required to absorb so large a quantity of gums; and that after treatment by their process the amount of decolorizing carbon required to filter any sugar liquor efficiently is smaller, if the carbon is added for the purpose of filtration and not for the sake of decolorization only.—*Nellie E. Fealy.*

4039. Kincer, J. B. **The adjustment of agriculture to climate.** Bull. Amer. Meteorol. Soc. **5**: 123–125. 1924.—In this author's abstract, attention is directed to 3 general types of farming based on the amount of rainfall and the limited land areas suitable for food production. A discussion of the paper is appended.—*Earl S. Johnston.*

4040. Kirk, L. E. **Report of the committee on standardization of descriptive terms used**

in field experimental work. **Western Canadian Society of Agronomy.** Sci. Agric. **4**: 242–246. 1924.—The subject is treated under 2 main heads, namely, general and miscellaneous descriptive terms. Under the former the chief divisions are germination, roots, stems, and heads. Under the latter the divisions are bloom, maturity, green weight, dry weight, diseases, earliness of growth, aftermath, seed, clovers and alfalfa, field roots, corn, and sunflowers.—*T. G. Major.*

4041. Kramer, Otto. **Die Krankheiten und Schädlinge der Reben in Württemberg im Jahre 1924.** [Diseases and pests of grapevines in Wurttemberg in 1924.] Mitteil. Deutsch. Landw. Ges. **40**: 23–26. 1925.—The past year was one of the worst experienced in Württemberg for the attacks of Peronospora. Notes are given on this and on the presence of other disease and insect enemies during 1924. Trials were made of various remedies, 11 being used. Of these "Rosperal" was found the best and very satisfactory.—*A. J. Pieters.*

4042. Lipman, J. G., and A. W. Blair. **The utilization of nitrogen in soils and fertilizers as affected by lime.** Indust. and Eng. Chem. **16**: 373–375. 1924.—A brief review is given of experiments started at the New Jersey Agric. Exp. Sta. in 1898 for the purpose of studying certain phases of the nitrogen problem as related to crop production.—*Henry Schmitz.*

4043. Love, H. H. **The role of statistics in agronomic experimentation.** Sci. Agric. **5**: 84–92. 1924.—In this paper the writer deals with the "probable error"—its definition, methods of use, and value. A plea is made for an extensive use of this method in agronomic experimentation.—*T. G. Major.*

4044. Loveland, G. A. **The influence of climate on wheat production in Nebraska.** Bull. Amer. Meteorol. Soc. **5**: 43–44. 1924.—The author's abstract and discussion are given of a paper presented at the Cincinnati meetings of the American Meteorological Society.—*Earl S. Johnston.*

4045. Lunden, J. Chr. **Hösten af Roefrö i 1923 og Roefröhandelen i Vinteren 1923–24.** [The 1923 seed harvest of root crops and its commercial value during the winter of 1923–1924.] Tidsskr. Landøkonomi **5**: 770–790. 1924.—For statistical purposes, Denmark is divided into Jutland and the islands. During 1923, there were 15,828 ha. of root crops grown for seed purposes on the islands and 7470 ha. in Jutland, a considerable gain over 1922. After seed harvest, the plants are utilized as fodder or manure. About 1297 tons of seed were exported, 89 tons to the United States, 147 tons to Germany, 98 tons to Sweden and the remainder to England, France, Norway, Holland and elsewhere.—*Albert A. Hansen.*

4046. Lynn, J. C., and D. Anderson Lynn. **Observations on the improvement of poor pasture in the West Riding of Yorkshire.** Ann. Appl. Biol. **11**: 135–152. 1924.—The application of lime to high-lying rough pasture resulted in the breaking up of the mat formed by White bent (*Nardus stricta*) decreasing its growth as well as that of other undesirable grasses and at the same time encouraging the finer grasses and clover. The alkalinity resulting from the use of lime favors the growth of bacteria which are effective in decomposing the mat. The improvement was noticeable for many years afterward. Lime followed by basic slag gave even better results, but basic slag alone had no effect. In pastures where *Agrostis* predominated the mat was thinner and more open than that formed by *Nardus*. Such pastures were improved by lime in some cases and even responded to basic slag alone when the mat was not over 1½ inches thick. Beneficial results from the application of lime were obtained even on lower-lying and better-class pastures.—*A. W. Henry.*

4047. McCollam, M. E. **Notes on several prevalent weed pests.** Bi-monthly Bull. Western Washington Exp. Sta. **11**: 26–29. *3 fig.* 1923.—Quack grass, Canadian thistle, and perennial sow thistle are discussed.—*F. D. Heald.*

4048. McCollam, M. E. **Report on grain varieties.** Bi-monthly Bull. Western Washington Exp. Sta. **11**: 67–69. 1923.—This report presents tabulated results of station tests of the best winter and spring varieties of cereals for seasons of 1916–1923.—*F. D. Heald.*

4049. McCollam, M. E. **Spring grain—culture, varieties, yields.** Bi-monthly Bull. Western Washington Exp. Sta. **9**: 85–87. *3 fig.* 1922.—Superphosphate and manure are reported as the best fertilizers for oats on upland "shot clay" soil, based on a 4-year test. A 6-year average yield of the 10 best oat varieties, and 5-year average yields of 5 varieties of spring wheat are given.—*F. D. Heald.*

4050. McRostie, G. P. **Longevity of alfalfa and clover seeds.** Sci. Agric. 4: 236–238. 1924.—Germination tests were made of lots of red clover, alfalfa, and alsike clover seed varying in age from 2 to 10 years. There was a rapid falling off in percentage germination after the 9th year in the case of red clover and alfalfa, indicating a rapid approach to the limit of storage in a viable condition. The difference between yellowish and purplish red clover seed in relative longevity was slight, the former losing their vitality a little faster after the 4th year.—*T. G. Major.*

4051. McRostie, G. P. **Some forage crop needs and difficulties in Canada.** Sci. Agric. 5: 97–99. 1924.—One of the chief problems in forage crop improvement in Canada is the vast extent of territory to be served, with the wide variations in climate and soil. In the dry regions the question of the residual effects of various forage crops is important. The lack of uniformity in varieties sold under the same name points to the need of a complete classification of the forage crops and the purification of the existing strains.—*T. G. Major.*

4052. McRostie, G. P. **The modern trend of forage crop improvement.** Sci. Agric. 5: 13–17. 1924.—In connection with crop distribution and classification the trend seems to be toward the classification of our various forage crops on the basis of their suitability to different zones. Greater care in experimental technique with a view to more reliable conclusions appears to be the most out-standing feature of the modern trend in regard to experimental methods. In the field of crop improvement the present day tendencies are in the direction of the elimination of undesirable types by crossing and towards the utilization of the phenomenon of hybrid vigour.—*T. G. Major.*

4053. Malcolm, J. L. **History of the Natal sugar industry.** South African Sugar Jour. 8: 745, 747, 749. 1924.—This address delivered more than 6 years ago by Mr. Malcolm gives the history of the Natal sugar industry from its inception.—*Nellie E. Fealy.*

4054. Merkel. **D. L. G. Futterrüben-Hauptprüfungsergebnisse 1922. [D. L. G. Fodder beets. Report on the leading tests, 1922.]** Mitteil. Deutsch. Landw. Ges. 40:7–10. 1925.—A report is given on the fresh and dry weights and sugar content of several varieties of fodder beets at 15 stations.—*A. J. Pieters.*

4055. Miller, Edgar S. **Some observations on milling: No. 4. Conditioning the wheat.** Nation. Miller 26[11]: 32–35, 74. *Pl. A, AA.* 1921.—Tempering or wetting wheat before grinding for flour is an almost universal practice to decrease the brittleness of the cellulose in seed coats or bran, so that it will not break and become mixed with the flour. There is little knowledge and therefore little agreement in practice as to the quantity of water or the time required for best results. With a given quantity of water, greater softening of the cellulose occurs with increasing temperature up to 100 degrees. It is known that immersed wheat continued to absorb water for 20 hours. The chief difficulty lies in getting the water rapidly into the crease or furrow on the ventral surface of the kernel without wetting the mass more than is desirable under commercial conditions. In many wheat varieties this crease practically is closed at the top for at least a part of its length. The writer regards the black ridge at the bottom of the crease as neither ergot nor dirt, but primarily a ridge of bran cells. His experiments show that more gluten is located in the cheeks of the kernel than in other portions. —*Carleton R. Ball.*

4056. Newton, R., and W. R. Brown. **Losses in wilting and ensiling sunflowers.** Sci. Agric. 4: 385–393. 1924.—The losses incident to ensiling sunflowers cannot be reduced by wilting the material before filling the silo. The use of a water-tight silo is not advisable, owing to the inferior silage which results from the excessive moisture. Satisfactory results have been secured from the practice of ensiling the fresh-cut sunflowers with cured cereals, provided the silo is sufficiently high to permit pressure enough to ensure proper packing and curing.—*T. G. Major.*

4057. Niggl, L. **Die Bedeutung der Viehweide für die süddeutschen Ackerbaugebiete. [The importance of pastures in South German agriculture.]** Mitteil. Deutsch. Landw. Ges. 39: 823–836. 1924.—In this address, the speaker maintains that pastures can be so improved, especially by drainage, that much of the money spent for imported feed stuffs can be saved. —*A. J. Pieters.*

4058. Overgarrd, J. C. **Udersögelser over Landbrugets Driftsforhold.** [Survey of

financial status of agriculture.] Tidsskr. Landøkonomi 6: 344–353. 1924.—A consideration of farming conditions in Denmark from a financial viewpoint during 1920–1921. Price tables and other statistical data are included. [See also Bot. Absts. 9, Entry 626.]—*Albert A. Hansen.*

4059. Palm, B. T., and S. C. J. Jochems. **De voornaamste tabaksziekten in Deli in verband met de begroeiing der tabaksgronden.** [**Principal tobacco diseases in Deli in relation to the vegetation on fallow tobacco land.**] With English summary. Bull. Deli Proefsta. Medan-Sumatra **20**: 1–69 + 5. *15 pl.* 1924.—This article deals with the wild and cultivated plants which occupy the land between crops of tobacco, as possible carriers of the 3 principal tobacco diseases in Deli; slime disease (*Bacterium solanacearum* E F S), mosaic and phytophora disease (*Phytophthora nicotianae* Br de H). Tobacco is grown on the land only once in 7 to 10 years and in the interval between crops the land practically remains undisturbed except that a crop of rice (dry culture) is frequently grown after the tobacco. The succession of plant associations during the period of fallowing terminates in a secondary forest consisting of some trees and an undergrowth of shrubs, herbaceous species and, more especially, lianas, the latter being predominant. In the 2-year period of preliminary preparation of the ground for tobacco, which includes drainage, herbaceous plants become established in large numbers. Following the tobacco crop, reforestation of the land with *Albizzia falcata* is practised to a limited extent. The vegetation on tobacco land contains about ½ of the 128 species which have been shown to be susceptible to the slime disease. Several wild and cultivated species growing on tobacco land are possible carriers of mosaic and phytophora disease.—*W. W. Garner.*

4060. Parr, P. H. **A note on gur.** Internat. Sugar Jour. **26**: 532–534. 1924.—The author gives a brief sketch of sugar production in India. About 99% of India's annual production of more than 3,000,000 tons of sugar is made of gur, known also as "gul" and "jaggery," that is, cane juice and palm juice concentrated to solidification without purification except through the addition of a small amount of alkali and the removal of scums. This gur is consumed locally and mostly in the crude form in which it is produced. The simplest method of refining gur is to dissolve, clarify with lime and heat, filter to remove mechanical impurities, crystallize in vacuo, and separate the crystals in a centrifugal, the result of this being roughly equivalent to the 2nd sugars obtained in an ordinary defecation factory. Treated thus, approximately 100 pounds of gur of the average composition given above, may be expected to give about 45 pounds of sugar of 94° purity, and 55 pounds of molasses of 55° purity. Analysis is given.—*Nellie E. Fealy.*

4061. Patterson, T. H. **Lucerne-growing in South Auckland.** New Zealand Jour. Agric. **27**: 240–242. *1 fig.* 1923.—An attempt to control the root fungus (*Rhizoctonia medicaginis*), which has appeared in the Waikato and Bay of Plenty districts during the past 5 years, is described. The trial was conducted on pasture land which was very thoroughly prepared and well fertilized. During the first 2 years the lucerne was harrowed several times. No fungus had appeared at the end of this time and it is hoped that by retaining the vigor of the lucerne through good treatment it will become resistant to invasion.—*H. L. Westover.*

4062. Patton, W. R. **Growing the potato royal in Idaho.** Potato Mag. 4^8: 5, 6, 16, 17. *2 fig.* 1922.—The author states that, in general, Idaho potatoes have a high reputation and he substantiates his statement by this quotation from the U. S. A. Dept. of Agric. Market Reporter "because of exceptional quality and superior grading." To this quotation he adds that "there seems to be something about the volcanic soil of Idaho, combined with its cool climate, that puts most desirable qualities into her tubers." The Charles Downing (Idaho Rural) referred to in this article as Rurals and the Russet Burbank generally referred to as Russets, Gems, or Netted Gems, are the leading commercial varieties, their importance being in the order mentioned so far as production is concerned. The Egin Bench area in Fremont County is regarded by the writer as the natural home of the Russet Burbank potato. Here it is claimed to grow to a perfection which justifies its being called "The Potato Royal." Egin Bench soil is said to be composed of cinders with an admixture of sand and heavier soil, imparting to it the looseness and permeability necessary to good air and moisture movement and ease of cultivation. It is also claimed to contain all the mineral elements necessary to the proper development of the potato plant. Irrigation ditches are run at intervals of 5–30

rods apart. Under such favorable conditions it is little wonder that yields of 300–600 bushels per acre are regularly obtained. One grower is reported to have averaged more than 335 bushels of "Grade 1" or "Fancies" to the acre for 4 successive seasons and with as low as 5% of culls. Another grower is claimed to have averaged over 300 bushels per acre on a 64-acre field and on 1 measured acre he produced a little more than 750 bushels.—*W. Stuart.*

4063. Piper, C. V., and A. J. Pieters. **Green manure for restoring soils. A complete treatise adaptable to sugar farms.** South African Sugar Jour. **8**: S17, S19, S21, S23, S25, S27. 1924.—The authors define green manuring, give a brief history of green manuring in different countries, enumerate the crops used in each of the countries for green-manuring purposes, and discuss their subject under these headings: Effects of green manuring, nitrogen supply, nitrogen added to the soil, ammonification and nitrification, nitrogen-fixing organisms, rate of decomposition, effect of lime, loss of nitrogen, and composition of green-manure crops.—*Nellie E. Fealy.*

4064. Proskowetz, Em. [Rev. of: Schindler, Franz. **Handbuch des Getreidebaues auf wissentschaftlicher und praktischer Gründlage. (Handbook of cereal culture from the practical and the scientific viewpoints.)** *3rd. rev. ed., 530 p. 130 fig.* P. Parey: Berlin, 1923 (see Bot. Absts. 13, Entry 49).] Wiener Landw. Zeitg. **73**: 58. 1923.

4065. Rippel, August. **Stickstoffhaushalt im Ackerboden mit besonderer Berücksichtigung der Brache. [Nitrogen balance in field soil with special reference to fallow.]** Mitteil. Deutsch. Landw. Ges. **40**: 26–28. 1925.—Certain investigations started by Alfred Koch have run 20 years and show the effect of fallow, clover and stable manure. In cylinder studies the addition of sugar resulted in a considerable fixation of N so that in the period 1906–1922 the crops grown in the cylinders with sugar removed 1259 mg. more N than those without sugar, 4.08 mg. N having been furnished the plants for every gm. of sugar. Trials with cellulose, as in straw, failed however to give results, though Koch (Centralb. Bakt. II **27**: 1. 1910) is said to have demonstrated analytically the fixation of N when straw was applied. Tests were made by growing plants in soils taken from varying depths in the same field. The general result showed that the readily transformable N was exhausted in a few years, yields falling from 205.3 gm. dry weight in 1903–1906 with 1697 mgm. N to 137.8 gm. dry weight in 1907–1910; 67.1 gm. dry weight in 1911–1914; 69.3 gm. dry weight in 1915–1918 and 77.9 gm. dry weight in 1919–1922. This shows that when the readily available N is once exhausted the nitrates produced from the humus are formed at nearly a constant rate and limit the crop production. In the lower soil layers there was a smaller supply of readily available N in the soil, the amounts decreasing with depth. A trial of fallow, clover stubble turned under and manure on beets fallowed in each case by a rotation of winter wheat, winter rye and oats and carried on from 1904 to 1923 showed that for the 1st few years the yields after fallow increased greatly, a result which the author attributes to the rapid mobilization of the available N by cultivation. The yields after clover stubble changed more slowly but toward the end of the period materially exceeded those after fallow, while the yields after stable manure applied to beets were best of all. The author sums up with the words "Fallow, continuous field cropping and tests in pots show the same picture; a strong mineralization of the available soil N at first, with higher initial yields or immediately increasing yields; then a rapid decline in yields under the earliest returns followed by slower decline or relatively uniform returns over a long time."—*A. J. Pieters.*

4066. Rostrup, Sofie. **Kornets Blomsterflue i Danmark, 1903–1923. [Hylemyia coarctata in Denmark, 1903–1923.]** Tidsskr. Planteavl **5**: 713–759. 1924.—Kornets flower fly, *Hylemia coarctata*, is a serious pest of young winter rye and wheat. The results of experiments here reported suggest that where wheat and rye are to be sown in localities infested with the fly, the land must not be allowed to remain fallow from about July 20 to August 30. A number of other suggestions on controlling the pest and a life history story of the fly are included.—*Albert A. Hansen.*

4067. Roxas, Manuel L., and Angel A. Africa. **Clarification in raw sugar factories.** Internat. Sugar Jour. **26**: 486–491. 1924.—The authors give a detailed report of the preliminary results which they obtained from the use of Deerr's method for determining the proper reaction for liming in defecation in raw sugar manufacture, prefacing the report with a brief

summary of the opinions of several authorities on the subject. The conclusions drawn by the authors are: (1) The end reaction to be attained, or residual acidity to be left in liming different juices, varies according to the nature of the cane and does not seem to have a fixed pH value; (2) when the lime is added to cold juices in gradually increasing amounts and they are brought to boiling and then allowed to settle, 2 points of maximum clarity are obtained, one on the acid side of neutrality and the other on the alkaline side; (3) for close control of liming in a factory where the nature of the juice varies for every tankful, it is desirable to determine the right reaction to lime for every tankful, and in such case continuous clarifiers or settling tanks must be used.—*Nellie E. Fealy.*

4068. Russel, H. L., and F. B. Morrison. **New facts in farm science.** Wisconsin Agric. Exp. Sta. Bull. 362. *1–115. Fig. 1–40.* 1924.—An introductory section, "Looking backward," by H. L. Russell gives a historical summary of "New facts in farm science" for the period 1903–1923.—The body of the work then takes up in more detail the discussion of a wide variety of recent achievements in agricultural science with particular reference to Wisconsin conditions and to the results of investigations by the staff of the Wisconsin Agric. Exp. Sta.—*Frederick V. Rand.*

4069. Sayer, Wynne. **Mill trials of Coimbatore sugar cane seedlings 232 and 233** Internat. Sugar Jour. **26**: 584–585. 1924.—Both Co 232 and Co 233 are seedlings of the same parents, P.O.J. 213 and Katha (a Punjab cane). These were rapidly multiplied by a method of short planting adopted at Pusa. Although the local cane, Bhurli, suffered badly from deficient rainfall, these canes grew well and gave a fair yield, but the effect of lack of rain was extremely marked in actual tonnage. The results of mill trial, which was made after the canes were overripe, are given for both varieties. While Co 232 was better in the mill than Co 233, it still did not show itself to be very desirable from the factory point of view. Summing up the results of his year's experiment, the author states that in Co 232 "we have a fairly tall, straight-growing cane, with the character of early ripening and a good sucrose content," but it remains to be determined by a proposed test whether in a normal season it will yield about 6,000 maunds of stripped cane per acre, and whether healthy, well-grown, fully mature cane of this variety when subjected to a mill trial will show better purity.—*Nellie E. Fealy.*

4070. Schafer, E. G., E. F. Gaines, and O. E. Barber. **Washington barleys.** Washington [State] Agric. Exp. Bull. 181. *1–25. Fig. 1–6.* 1924.—The results of nursery and field tests of barley with a consideration of the source, description and classification of the varieties grown and data relating to the extent and value of the barley crop in Washington are presented.—*F. D. Heald.*

4071. Schafer, E. G., E. F. Gaines, and O. E. Barber. **Washington oats.** Washington [State] Agric. Exp. Sta. Bull. 179. *1–29. Fig. 1–11.* 1923.—The results of nursery and field tests of oats, with a consideration of the source, description and classification of the varieties grown and data relating to extent and value of the crop in Washington are presented.—*F. D. Heald.*

4072. S[cott], M. J. **Manurial trials at the College.** Canterbury [New Zealand] Agric. Coll. Mag. **5**: 66–70. 1924.—Results are given of experiments with wheat, hay and kale. The observed differences are considered insignificant.—*H. H. Allan.*

4073. Smith, J. M. **The lucerne-seed crop.** New Zealand Jour. Agric. **28**: 176–178. *1 fig.* 1924.—Most of the lucerne seed produced in New Zealand is grown in the Marlborough district. The Marlborough seed is generally recognized as best for New Zealand conditions. The seed was formerly imported but as a result of growing many years in the Marlborough district its original characteristics have been modified and a strain has resulted that is better suited to the local conditions. The methods of handling the seed crop are not materially different from those employed in other countries. The straw is sometimes used in the ensilage stack by mixing with green lucerne.—*H. L. Westover.*

4074. Stapledon, M. A. **Putting land down to grass.** *11 p.* Herald Press: Bath, 1924. —This is a consideration of the more important aspect of grass culture in Britain. Permanent grass pastures are at their best in May and June, ⅔ of their total yield being in this period. The great importance of temporary grass is to provide pasturage for seasons when permanent

grass pasturage is scarce. Clovers make the most important element of grassland and to secure them drainage, lime and phosphate is vital. Drilling grass seed is the best method of seeding. Even with high quality seed, less than ½ of them produced plants in trials at Aberystwyth. In establishing permanent pastures 2 practices prove to be harmful: (1) heavy grazing the 1st spring and (2) growing a heavy hay crop the 1st season. Seed mixtures are discussed at length. The general tendency is toward less complex mixtures.—*C. V. Piper.*

4075. Stapledon, R. G., and Rhoda Jones. **Lucerne.** Jour. Ministry Agric. Great Britain **30**: 1099–1106. 1924.—In 1923 there were 57,900 acres of lucerne in England and Wales, most of it in the eastern, southeastern and middle counties of England. No county had as much as 1,000 acres. In variety tests, Provence lucerne has proved the best among European lucernes. In a 2-year test, Provence outyielded Grimm the 1st year but during the second year Grimm yielded more. This variety is believed to be worthy of further trial. Other features discussed are soil, preparation, manures, inoculation and feeding value.—*H. L. Westover.*

4076. Stokes, W. E. **Crotalaria as a cover crop in citrus groves.** Proc. Florida State Hort. Soc. **1924**: 108–111. 1924.—The practice is to sow 12–20 pounds of seed to the acre from March to the end of June on well prepared land. Satisfactory stands and excellent growth have resulted on high pine land. It seems best to mow once during the year—preferably at the time of flowering or soon after blooming—to prevent the crop from getting too coarse. The 2nd crop will then come on rapidly and produce enough seed to reseed the land. The mowing should be 8–10 inches high in order to get best results with the 2nd growth.—*J. C. Th. Uphof.*

4077. Stuart, Wm. **The relation of science to the potato industry.** Sci. Agric. **4**: 205–209. 1924.—Following the destructive late blight epidemics of 1843–1847, Goodrich of Utica, New York, conceived the idea of producing a new variety by sexual reproduction in order to secure greater vigor and disease resistance. As a result, the Garnet Chili, a true seedling of a South American strain, was introduced in 1857. Between 1876 and 1900 the important events in the history of the potato industry were the appearance of the Colorado potato beetle, an increased knowledge of diseases, especially early and late blight and common scab, the gradual evolution of the technique of spraying, the development of the horse-drawn planter and the elevator type of digger, and the introduction of new varieties such as Burbank, Early Ohio and Green Mountain. From 1901 to 1923, the chief developments were the extensive breeding experiments in Great Britain and Europe in 1904–1905, the systematic classification of varieties into groups, seed potato inspection and certification, the recognition of superior strains within the varieties, identification of such diseases as mosaic, leafroll, spindle tuber, streak, etc., insect studies, and the improvement of transportation facilities.—*T. G. Major.*

4078. Tice, C. **Certified seed potatoes. Why they will pay.** British Columbia, Dept. Agric. Soil & Crop Div. Circ. 1. *1–6. 5 fig.* 1923.—The author defines certified seed potatoes and then proceeds to give brief descriptions of the diseases such as leafroll and mosaic, which decrease yields. Pure seed is emphasized and a list of desirable varieties to grow is given. In discussing the value of certified seed the statement is made that on many farms the use of such seed would double the yields now produced. In his conclusions the author tells the purchaser of certified seed potatoes that not all certified seed will give good returns but that in the majority of cases they will prove superior to uncertified seed.—*W. Stuart.*

4079. Tresize, S. **Difficulties in the crushing of Uba cane.** Internat. Sugar Jour. **26**: 586–590. 1924.—One of the greatest obstacles with which the South African sugar industry must contend in its competition with the sugar industry of other countries is the exceptional hardness of its cane, its fiber content being 17%, while the fiber content of Uba in wholly tropical countries averages 10 to 12%, the sucrose content in both cases being about 13%. The author gives a detailed and interesting description of the steps followed in handling the crop and of the equipment used, and makes practical suggestions for meeting the requirements in the way of improved equipment.—*Nellie E. Fealy.*

4080. Wagner, Paul. **Einige Klarstellungen und Ergänzungen zu den Versuchen der D. L. G. über Stickstoffdüngung des Winterroggens.** [Some explanations and supplementary

remarks on the D. L. G. experiments with nitrogen manuring of winter rye.] Mitteil. Deutsch. Landw. Ges. 40: 10–14. 1925.—A study of many experiments leads to the general conclusion that on extremely poor soil and where only moderate increases can be expected, it will be profitable to use 1 good application of nitrogen-carrying fertilizer. Where greater increases can be expected, double as much nitrogen-carrying fertilizer may be used, while on fertile land where the yield is normally so good that but small gains may be hoped for, only very moderate applications of fertilizer should be made.—*A. J. Pieters.*

4081. Warner, T. A. **Closer settlement applied to sugar farming. Pitfalls and possibilities discussed.** South African Sugar Jour. 8: 737–739. 1924.—The author believes that "the finest thing that could happen to the sugar industry today would be a well thought out scheme of small farm sugar production under either Government or private direction" but to make a success the prospective grower must start under certain definitely defined conditions. He briefly sets forth the factors that should be carefully understood, particularly that in calculating the crop returns, consideration must be given to the fact that after 3–5 crops the whole process of ploughing, fertilizing, replanting, etc., must be repeated; to the means and cost of transportation; and to availability of markets. The author mentions other essential factors, that is, quality of soil, rainfall, configuration of the ground, labor supply, etc.—*Nellie E. Fealy.*

4082. Watson, J. R. **Crotalaria as a trap crop for pumpkin bugs.** Proc. Florida State Hort. Soc. 1924: 105–107. 1924.—The pumpkin bug feeds on succulent vegetation but in the fall when such vegetation has become scarce it is prone to attack citrus. The precaution usually recommended consists in thorough cutting of the cover crop during the middle of September. *Crotalaria* attracts this insect and is therefore recommended in citrus groves to eradicate the pest.—*J. C. Th. Uphof.*

4083. Watts, Alfred J. **The origin of the Uba cane.** Internat. Sugar Jour. 26: 478–479. 1924.—The author's discovery in a Pernambuco newspaper of Uba as the name of a town in the State of Minas Geraes in southern Brazil led him to write to the Secretary of the "Sociedade Nacional d'Agriculture" of Rio in the hope of obtaining some light on the origin of the word as applied to the variety of cane known as Uba. The part of the reply relating to the subject is given, and "while the information appears to leave it an open question," the evidence is not all against the pre-Columbian existence of some kind of sugar cane in Brazil.—*Nellie E. Fealy.*

4084. Woodman, Herbert Ernest. **The grading, composition and feeding values of wheat offals.** Jour. Ministry Agric. Great Britain 30: 593–602. 1923.—Systematic investigation of 83 samples of wheat offals supplied by firms trading in England and Wales revealed (1) that the grade known as "pollards" has almost completely disappeared, (2) that present-day offals fall into 3 main grades, decreasing progressively in size of particles, brans, middlings and fine middlings, which possess sharply differentiated chemical characters, and (3) that a simple uniform method of grading offals on the basis of size of particles yields grades which are characterized by a perfectly distinctive chemical composition (both in crude and digestible constituents) and also by the possession of well defined feedings values. The percentage of protein and carbohydrates decreases continuously as the size of particles increases, but the reverse is true for fiber and ash content. Fat content is highest in "middlings" and lowest in "fine middlings." Digestibility of dry matter, organic matter, fat, and carbohydrate increases progressively as the size of particles decreases. Digestibility of protein is practically independent of the size of particles.—*C. E. Leighty.*

SOIL SCIENCE (EDAPHOLOGY)

4085. Anonymous. **Soil experiment fields in the northern and eastern states.** Amer. Fertilizer 61[11]: 30, 31. 1924.—A list is given of the fields in the northern and eastern states where experiments on soils and fertilizers are conducted and a sketch map shows the location of these fields.—*T. D. Rice.*

4086. Atkins, W. R. G. **Notes on the filtration and other errors in the determination of the hydrogen ion concentration of soils.** Notes Bot. School Trinity Coll. Dublin 3: 265–271. 1924.—As a general rule increasing or decreasing the proportion of soil to water, within limits,

does not appreciably alter the pH value. The pH value of some soil extracts is markedly modified by filtration, even when the 1st filtrate is rejected. Results of experiments on these 2 points are tabulated, as are also results on tests of the pH value of acid-extracted and unextracted filter papers. The indicator brom cresol green is preferred to methyl red for the same pH range.—*G. B. Rigg.*

4087. Brioux, Ch. **Influence de l'urée, employée comme engrais, sur la réaction du sol.** [The influence of urea, employed as fertilizer, on the reaction of the soil.] Compt. Rend. Acad. Sci. Paris 179: 915–917. 1924.—The affect of urea at first is to make the soil more alkaline, due to the formation of ammonium carbonate. Later, however, due to the process of nitrification, the acidity of the soil rises.—*C. H. Farr.*

4088. Burgess, Paul S., and F. R. Pember. **Active aluminum as a factor detrimental to crop production in many acid soils.** Rhode Island Agric. Exp. Sta. Bull. 194. *1–40. Fig. 1–5* + 1. 1923.—In the acid soils studied, active aluminum, the principal toxic factor, was measured. Its effect was modified by very large applications of soluble phosphate even though the acidity was not reduced. The economic antidotes are lime and phosphates. In overcoming the deleterious effects of aluminum, phosphorus appears useful within the plants as well as in the soil. A tentative classification is given of the reaction of a number of crop plants to an acid soil, together with correlated measurements of pH, alumina, and lime absorption.—*B. L. Hartwell.*

4089. Hopkins, E. S. **Soil moisture investigations in Canada.** Sci. Agric. 5: 79–83. 1924.—Experiments are being carried on at the Swift Current, Saskatchewan, Experimental Farm to determine the water requirements of various grain, hay and hoed crops. It is hoped that, from these and other experiments on crop rotations, systems of cropping may be evolved which will overcome the effects of the wide variation in the precipitation during the growing season.—*T. G. Major.*

4090. Huber, Bruno. **Eine einfache Methode zur Messung der Verdunstungskraft am Standort.** [A simple method for measuring the force of evaporation.] Ber. Deutsch. Bot. Ges. 42: 19–26. 1924.—The author discusses the need of the botanist for an efficient method of measuring the rate of evaporation. Comparisons of results obtained with the psychrometer and Pische's evaporimeter were made and the conclusion was reached that the psychrometer furnishes a simple method for measuring the force of evaporation and one more accurate than is necessary for the purposes of the botanist.—*T. D. Rice.*

4091. Kvapil, K., and A. Nemec. **Sur la relation entre la "capacité absolute de l'air" et le degré d'acidité des sols forestiers.** [Relation between absolute capacity of the air and degree of acidity of forest soils.] Compt. Rend. Acad. Sci. Paris 179: 1283–1284. 1924.—The absolute capacity of air is the volume of the pores in a soil which, after saturation of the soil with water, still remain filled with air. Readings are given for acidity of soil supporting conifers, of different ages, broad-leaved forests, and mixed forests, respectively. The absolute capacity of air is also given for these soils in percentages. The broad-leaved forests give the lowest absolute capacity and the highest acidity. The mixed forests give the highest absolute capacity.—*C. H. Farr.*

4092. Lint, H. Clay. **French experiment with sulphur as a fertilizer.** Amer. Fertilizer 61[10]: 26. 1924.—The French studies have been centered about the fertilizing action of sulphur on the soil as shown by the increased yields of crops. Tomatoes, potatoes and other root crops have made the greatest responses.—Experiments by Jacharewiz showed an increase in the yield of tomatoes through the use of sulphur. A darker green coloration of the leaves was noted and a higher starch content. Farm manures had much the same influence as the application of sulphur.—Recently, Rene C. L. Marcard has published a thesis on sulphur as a fertilizer. He concludes that sulphur is not only a disinfectant but also a fertilizer and that it facilitates the ammonification of organic compounds.—*T. D. Rice.*

4093. Lochhead, A. G. **Some trends in soil microbiology.** Sci. Agric. 4: 308–313. 1924.—Until recently little attention has been paid to the science of soil microbiology. The early work had largely to do with the relation of bacteria to nitrification. Faulty technique, as for example the plate count method, is a retarding factor in the development of the science. At the present time much attention is being given to the action of protozoa, fungi, actinomy-

cetes, algae, and bacteriophages in the soil. Objective work, such as that done by Löhnis on the life cycles of the bacteria, is assuming much importance. The indications are that a biological method of measuring soil productivity will be developed. A direct microscopical method for soil examination is needed. In brief, more fundamental work on the soil flora is necessary as a basis for the development of applied soil microbiology.—*T. G. Major.*

4094. McCollam, M. E. **Fertilizer trials on common soil types.** Bi-Monthly Bull. Western Washington Exp. Sta. 9: 106–109. 1922.—This paper gives results of experiments with gypsum, nitrate of soda, sulphate of potash, complete fertilizer, superphosphate, lime and manure on the yields of various crops.—*F. D. Heald.*

4095. McCollam, M. E. **10 year fertilizer test on muck soil.** Bi-Monthly Bull. Western Washington Exp. Sta. 11: 92–97. 1923.—Results of experiments with mangels, corn, kale and potatoes are given. Potassium caused a greater crop response than nitrogen, phosphorus or lime.—*F. D. Heald.*

4096. Maassen, Albert, und Heinrich Behn. **Das Verhalten der Bakterien, insbesondere der Bodenbakterien gegenüber dem Schwefelkohlenstoff, und die Beeinflussung des Pflanzenwachstums durch eine Schwefelkohlenstoffbehandlung des Bodens. [The behavior of Bacteria, especially soil bacteria towards carbon disulphide and the influence upon plant growth of carbon disulphide treatment of the soil.]** Arbeit. Biol. Reichsanstalt Land- u. Forstw. 12: 285–338. 1924.—The authors conclude from facts said to be established by their investigation that the peculiar effects favorable to plant growth resulting from carbon disulphide treatment of soil are brought about in 2 ways, namely, (1) by the physiological stimulation which CS_2 immediately exercises on plant growth, and (2) by the special increase in soluble plant nutrients which arises from the decomposition of organisms of various sorts killed in the soil by the CS_2.—The investigation involved the treatment of field plots different in soil type and in fertilization, and, simultaneously, the treatment of samples of each soil held in containers. The number of soil organisms present before and at certain periods following the treatments was determined by the plating method. Crops were grown to determine the effect on growth and yield. This work was done prior to the Great War.—The data verify the chief well-known observations relating to the improvement of plant growth and to changes in bacterial population. The results indicating physiological stimulation were increases of yield as a rule in ordinary earth or in sand provided with a surplus of plant nutrients. Increases did not appear in soil sterilized by heat, but were often shown in sterilized, fertilized sand. The absence of increases in the case of sterilized soil is thought to be dependent possibly on the changes made in the physical properties of the soil and need not therefore prevent the acceptance of stimulation. The explanation of the CS_2 effect by stimulation does not cover all cases, especially the favorable effect in the 2nd or 3rd year and the fact that the effect was relatively greater on unfertilized soil as compared with that fertilized with mineral salts.—Relating to other factors that might play a role in the CS_2 effect, it is stated that the data from plating do not indicate that unfavorable bacteria are suppressed and that the favorable are advanced. The changes in the composition of the bacterial population are often less in importance than the striking increase in numbers. If bacteria have a direct role, very diverse species would have a part. Accompanying the heightened activity of microörganisms is an increased availability of plant nutrients, as has been many times established; an instance occurs in the increase of mineral nitrogen at a period after the treatment. The present data show, however, that an increase in available plant food does not parallel an increase in decomposable organic matter, as might be expected. The growth forwarding effect of CS_2 was not greater on a soil richly supplied with organic matter like fresh manure. Thus far, moreover, it has not been proved that the source of the increased nitrogen is the air. Therefore, the source of the increase in plant nutrients must be found elsewhere than in the air or the humus supply. Such a source, according to the view of the authors, lies in the various soil organisms killed by the CS_2, this is, bacteria, fungi, algae, protozoa and higher animals.—*W. S. Beach.*

4097. Rabaté, E. **Action de l'acide sulfurique dilué dans les champs de céréales. [Action of sulphuric acid on fields of cereals.]** Compt. Rend. Acad. Sci. Paris 179: 1285–1287. 1924.—The effects on the soil, on the plants and on the foot-rot of wheat, are studied. Thou-

sands of wagon-loads of sulphuric acid are now each year used on fields of cereals. Due to the increased fertility of the soil, the destruction of weeds, and the prevention of certain parasitic diseases by this means, the yield has been increased 200 or more kgm. per ha.—*C. H. Farr.*

4098. St. John, J. L. **Gypsum and sulphur as fertilizers for legumes.** Washington [State] Agric. Exp. Sta. Popular Bull. 128. *1–11.* 1924.—This paper is a popular presentation of the use of sulphur in the Palouse country, based on work previously published (Bull. 145 and 165) and now in progress.—*F. D. Heald.*

4099. Sievers, F. J., and H. F. Holtz. **The influence of precipitation on soil composition and on soil organic matter maintenance.** Washington [State] Agric. Exp. Sta. Bull. 176. *1–32. 1 Fig.* 1923.—A study of the mechanical and chemical composition of the soils in the "Horse Heaven," "Big Bend" and Palouse" regions with rainfall varying from 7.5 to 21.5 inches per annum is reported. Among the conclusions is the statement that the nitrogen content of the soils varies in proportion to the rainfall, and that the nitrogen-carbon ratio is practically a constant.—*F. D. Heald.*

4100. Sievers, F. J., and H. F. Holtz. **The silt loam soils of eastern Washington and their management.** Washington [State] Agric. Exp. Sta. Bull. 166. *1–62. Fig. 1–26.* 1922. —A discussion of the soil, climate and cropping system of regions of eastern Washington which receive over 15 inches of precipitation per annum, is followed by a consideration of effective summer-fallow, substitutes for summer fallow, relation between available nitrogen and plant development, and quality of grain, loss of nitrogen by cropping and leaching, effect of straw, manure, soil composition and the use of legumes on the maintenance of organic matter, and the management of legume sod and crop rotation.—*F. D. Heald.*

4101. Smalley, H. R. **Some unsolved problems of fertilizer use.** Amer. Fertilizer **62**[1]: 21–23. 1925.—In addition to the many problems of scientific interest that yet remain unsolved there are at least 4 outstanding fertilizer problems, namely: What analyses are best, what formulas are best, how should fertilizer be applied, and how much fertilizer.—*George H. Dungan.*

4102. Treitz, P. és néhai Zsilinszky E. **A szikes talajok javitása. [Improvement of alkali-soils.]** *xiii + 311 p.* Budapest, 1924.—This monograph contains much original material by the author and is useful to every Hungarian botanist who deals with plant ecology.—*Györffy.*

4103. Winogradsky, S. **Sur l'étude de l'anaérobiose dans la terre arable. [A study of anaerobiosis in arable land.** Compt. Rend. Acad. Sci. Paris **179**: 861–863. 1924.—Arable soil is generally considered to be an aerobic medium. The activity of *Azotobacter* and the *Amylobacter* or butyric ferments are compared. The former flourish in soil which is aerated. If soil is not well aerated the latter are in evidence. A study is made of soils of different humidities. The anaerobic organisms are found to be quite inactive in moderately humid soils, but to play an important role in wet soils.—*C. H. Farr.*

BIBLIOGRAPHY, BIOGRAPHY AND HISTORY

Carroll W. Dodge, *Editor*

Charles A. Weatherby, *Assistant Editor*

(See also in this issue Entries 4006, 4014, 4053, 4224, 4276, 4374, 4390, 4673,4758)

4104. Anonymous. **Edward Lothrop Rand.** Rhodora **26**: 198. 1924.—Brief biographical note on Edward Lothrop Rand (1859–1924), author, with John H. Redfield, of a flora of Mt. Desert Island, and a founder of the New England Botanical Club.—*M. L. Fernald.*

4105. Anonymous. **Gustav Lindau.** Notizbl. Bot. Gart. u. Mus. Berlin-Dahlem **8**: 722. 1924.—This is a short biographical sketch and notice of the death of Gustav Lindau on Oct. 10, 1923, at the age of 57 years.—*Frederick V. Rand.*

4106. Anonymous. **The first recorded account of the use of tobacco, and the instrument through which it was inhaled.** Missouri Bot. Gard. Bull. **12**: 137–140. *Pl. 41–43.* 1925.—

Extracts are given from "La Historia General de las Indias" by El Capitan Gonzolo Fernandez de Oviedo y Baldes, published in 1535.—*O. T. Wilson.*

4107. Babcock, E. B. **On citing Richardson's botanical appendix to Franklin's first journey.** Rhodora **26**: 199, 200. 1924.—Within a year of the 1st printing, Richardson expanded his botanical appendix. It would be advisable, therefore, in citing publications of species in ed. 1 of Franklin's 1st Journey to cite both editions with original page numbers and to include also the page numbers of both reprints. For example, *Crepis nana* Richards. Frankl. Journ. App. ed. 1. 746 [18 in reprint] 1823; ed. 2. 757 [29 in reprint] 1823.—*M. L. Fernald.*

4108. Bailey, L. H. **George Lincoln Goodale.** Rhodora **25**: 117–120. *Portrait.* 1923. —This is a biographical sketch of Professor Goodale (1839–1923) who was actively connected with the teaching of botany at Harvard University and the development of its botanical museum from 1872 until shortly before his death.—*M. L. Fernald.*

4109. Bather, F. A. **Cooperative indexing of periodical literature.** Nature **107**: 550. 1921.—A conference to determine the needs of each branch of science is deemed unnecessary. The publication of abstracts before the index is justifiable, since they differ in aim, substance and preparation.—*O. A. Stevens.*

4110. Chatley, Herbert. **Science in old China.** Jour. North-China Branch Roy. Asiatic Soc. **54**: 65–80. 1923.—After a brief historical review of the ancient wisdom of the Chinese, a discussion is given of the "quasi-mathematical basis" for the Yin Yan theory which is inseparably connected with all Chinese thought. The latter half of the paper treats briefly of each of the following departments of science "as developed in old China:" Astronomy, botany, chemistry, engineering, geography, geology, mathematics, medicine, meteorology, physics, psychology, sociology, and zoology. In the paragraph on botany, reference is made to the **Nan Fang Ts'ao Mu Chuang,** a book of plant descriptions dating back to the Ts'in dynasty (265 to 420), and the **Pen Ts'ao Kang Mu** or "Materia Medica of China" from the Ming dynasty (1368 to 1644). A bibliography of 21 titles is given.—*Albert N. Steward.*

4111. Christensen, Carl. **Eug. Warming. En Levnedsskildring. [Eugene Warming. A biographical sketch.]** Bot. Tidsskr. **39**: 7–30. *6 portraits.* 1924.—Warming was born at Manø Denmark, Nov. 3, 1841, the son of a preacher who died 3 years later. He attended the Latin school at Kolding and later at Ribe. About 1859 he went to Copenhagen where he came in contact with Steinstrup, Roschhammer, Ørsted, Vaupell. In the summer of 1862 at Vaupell's suggestion, he made a collection of heaths of the west coast. He was not particularly interested in zoology but studied geology and minerology energetically. In 1862 he went to Brazil where he remained for 3 years, and secured 14 chests of plants. In 1868 he completed his work for the M.S. degree at the University, later going to Munich. He was appointed a docent at the University (1873–1882) and instructor in botany at the Stockholm High School (1882–1886). He returned to Copenhagen as Professor of Botany at the University and Director of the Museum (1886–1911). He traveled extensively over Denmark during the summers and in 1891 to the West Indies, Southern France, Italy, Tunis and other countries. He retired to Valby where he was busy the last year on the "Foundations of ecology." He died April 2, 1924, at the age of 82 years and 5 months. In 1871 Warming married Johanne Margrethe Hesperson of Aarhus.—*A. L. Bakke.*

4112. Evans, John W. **Cooperative indexing of periodical literature.** Nature **107**: 550–551. 1921.

4113. Fischer, Hermann. **Vitus Auslasser, der erste deutsche Florist und sein Kräuterbuch von Jahre 1479. [Vitus Auslasser, the first German florist and his herbal of the year 1479.]** Ber. Deutsch. Bot. Ges. **42**: 156–163. 1924.—Vitus Auslasser, a monk born in Vomp near Schwaz in Tirol, compiled a large manuscript of synonyms and over 200 figures of native plants (Codex latinus 5905 from Ebersberger Kloster, Münchener Stadtbibliothek). This, like the Hortus Sanitatis (Mainz 1485), probably is derived from Jacobus de Dondi (ca. 1349) published as the Aggregator practicus de simplicibus, Venet. 1499. The synonymy seems related to the Latin-German glossary to Macer Floridus in Tegenseer Codex Munchener Handschriftsammlung 18782 in South German dialect. Most of the figures of part 1 seem to be copies of

older works but some were undoubtedly drawn from nature. Although the drawing of the latter is often crude it gives evidence of very careful observation by the artist.—*C. W. Dodge.*

4114. Flahault, Ch., O. Juel, C. Schroeter, and A. G. Tansley. **Eug. Warming in memoriam.** Bot. Tidsskr. **39**: 45–56. 1924.—The 4 articles under this title have been written by men who were students of Warming or who have been closely associated with him and they all praise his ability in the field of ecology.—*A. L. Bakke.*

4115. Gaselee, Stephen. **Cooperative indexing of periodical literature.** Nature **107**: 551. 1921.

4116. H., I. **Dragutin Adolfo Hirc (16. IV. 1853–1. V. 1921).** Glasnik Hrvatskog Prirodoslovnoga Društva [Zagreb] **34**: 79–81. *Portrait.* 1922.—This is a short notice of a well-known Croatian florist.—*I. Pevalek.*

4117. J[ackson], B. D. **Prof. Carl F. O. Nordstedt.** Nature **113**: 576. 1924.—Norstedt died in Lund on February 6, 1924, at the age of 86 years. A brief review of his life and work is given. His studies of Charyophyta and fresh-water algae are noteworthy.—*Frederick V. Rand.*

4118. Maheux, George. **Provancher, the Canadian Linnaeus—his life and works.** Ann. Rept. Entomol. Soc. Ontario **52**: 28–30. Toronto, 1921 [1922].—This is a sketch of the life and work of Abbé Provancher.—*A. H. MacKay.*

4119. Mentz, A. **Warming som plantegeografisk Forsker.** [**Warming as an investigator in plant geography.**] Bot. Tidsskr. **39**: 39–44. 1924.—After Warming had been at the University of Copenhagen for 25 years he began in 1886 a series of lectures upon plant geography. From travels to the arctic and the tropical regions he had become familiar with the vegetation in different parts of the world. This served as a good setting for his work "Plantesamfund" which appeared in 1905. For the rest of his life Warming confined his attention to ecological studies. In 1908 his "Life forms" appeared. Shortly his "Plantesamfund" was translated into the English "Ecology of Plants." He was at his task until the last and in the final year his book, "Økologiens Grundformer" (Foundations of ecology), made its appearance. His system, built upon the life of plants, does not appear to have the possibilities of Raunkiaers' system of life forms. During the period 1905–1919 "The plant life of Denmark," a work in 3 volumes, was published.—*A. L. Bakke.*

4120. M[u]r[e]t, E. **Le centenaire du Dr. J. Coaz.** [**Centenary of J. Coaz.**] Jour. Forest. Suisse **73**: 121–124. *1 pl.* 1922.—The article is a résumé of the life work of J. Coaz, Switzerland's 1st Federal Forest Inspector (1875–1914). As an able leader and diplomat, organizer and forester he has elevated Swiss forestry to the highest rank and has imprinted his character upon it to the extent that the 40 years of his continuous service are called the "Coaz era."—*G. Kempff.*

4121. Newton, Arthur P. **Cooperative indexing of periodical literature.** Nature **107**: 551. 1921.

4122. Ostenfeld, C. H. **Warmings almindeleige botanisk virksomhed.** [**Warming's broad botanical activity.**] Bot. Tidsskr. **39**: 31–38. 1924.—Warming's botanical career really had its inception at the time he made his collections in Brazil (1863–66). After completing his work for his Master's Degree (1868) he went to Munich to be with Martius, the well known authority on Brazilian flora. He published *Symbolae ad floram Brasiliae Centralis cognoscendum*, at various times from 1867 to 1893. In 1875 he worked out the families Vochystaceae and Trigoniaceae in Martius' "Flora Brasiliensis." At Munich he also attended the lectures of Nägeli. Warming's thesis for his doctorate, which he received Feb. 17, 1871, was on the morphology of *Euphorbia*. For a time he was much interested in morphological studies and published an article, De l'ovule, in 1878. During the period from 1876 to 1879, several articles on the development of the egg cell came from his pen. Beginning with the late 70's, his works began to take on another aspect. In 1884 he published an article on the overwintering and awakening of shoots. He endeavored to group plants according to the kind of shoots produced. In 1884 he visited Greenland, and in 1885 Finland, for the purpose of becoming familiar with the physiology and anatomy of the plants of the arctic regions. Much of the material is given in English in 2 volumes. In 1888 the "Vegetation of Greenland" made its appearance. He considered that the plants of Greenland were introduced by the aid of the tide, the wind

and animals. In 1904 he published "The history of Danish vegetation since the ice age," including his own studies of the vegetation in all of Denmark, including her possessions. Warming, during the years 1881 to 1901, wrote 6 long papers upon the tropical water plant group, Podostemaceae. His text book of "Systematic botany and general botany" has not only been used in the Scandinavian countries but has been extensively translated. Warming also had the capacity of popularizing botanical work.—*A. L. Bakke.*

4123. Petrie, W. M. Flinders. **Cooperative indexing of periodical literature.** Nature **107**: 550. 1921.—Experience has led the author to adopt the following form in abstracting: (1) State briefly every new fact and argument that leads to a definite result; (2) add references to any confirmatory facts that have been omitted; (3) suggest whether the paper is essential.—*O. A. Stevens.*

4124. Robinson, B. L. **Emily Frances Fletcher.** Rhodora **25**: 149–150. 1923.—This is an appreciative biographic note on Miss Fletcher (1845–1923) and her amateur botanical activity in collecting wool waste plants in eastern Massachusetts.—*M. L. Fernald.*

4125. Robinson, B. L. **Miss Day.** Rhodora **26**: 41–47. *Portrait.* 1924.—This is an appreciative biographical sketch of Mary Anna Day (1852–1924), for 31 years librarian of the Gray Herbarium.—*M. L. Fernald.*

4126. Rosenvinge, L. Kolderup. **Eng. Warming og Dansk Botanisk Forening. [Warming and the Danish Botanical Society.]** Bot. Tidsskr. **39**: 3–6. 1924.—Warming's interest in the Danish Botanical Society began in 1862 at the early age of 20. His connection was interrupted for 3 years when he was on an expedition to Brazil. More than 90 papers have been submitted by Warming before this society. He took part in most of the excursions, the last one being in 1921 to South Jutland, when he was 80 years old. In order to make it possible to study the vegetation, Warming was instrumental in obtaining a special fund for this purpose.—*A. L. Bakke.*

4127. St. John, Harold. **William Conklin Cusick.** Rhodora **25**: 101–105. *Portrait.* 1923.—This is a biographical sketch of the pioneer Oregon botanist, W. C. Cusick (1842–1922).—*M. L. Fernald.*

4128. Setchell, William Albert. **American Samoa. Part II. Ethnobotany of the Samoans.** Carnegie Inst. Washington Publ. 341. *P. 191–224. Pl. 21–31.* 1924.—Part II gives a short account of the cultural practices of the Samoans, together with the plants concerned.—*Author.*

4129. Strabo, Walafrid. **Hortulus or the little garden, a ninth century poem.** *39 p. Illus.* Stanton Press: Wembley Hill, Middlesex [England], 1924.—This very interesting early poem on gardening is translated by Richard Stanton Lambert and illustrated by wood cuts by Elinor Lambert. The translation follows the text of Duemmler, Monumenta Germaniae Historia, 1884. The introduction contains a brief biography of Strabo (809–849) who also wrote the "Vision of Wettin." The Hortulus was first printed at Nuremberg in 1510.—*C. W. Dodge.*

4130. Tucan, F. **Antun Heinz.** Glasnik Hrvatskog Prirodoslovnoga Društva [Zagreb] **31**: 116–121. *Portrait.* 1919.—This is an obituary of Heinz, who was Professor of Botany at the University in Zagreb, with a list of his principal works.—*I. Pevalek.*

4131. Weatherby, C. A. **Another Davenport fern herbarium.** Rhodora **26**: 49–55. 1924.—George E. Davenport presented his herbarium of ferns to the Massachusetts Horticultural Society in 1879; but up to the time of his death in 1907 he contiuend to acquire specimens and the resultant collection, about 4500 sheets, was presented by his daughter, Mary Elizabeth Davenport, to the Gray Herbarium in 1922. The present paper is a somewhat detailed account of this important collection of ferns and excerpts from botanical correspondence, some of which cast side-lights of real interest. An account is given of the taxonomic acumen of William Stout, whose work apparently never reached print. Information regarding Stout is particularly requested.—*M. L. Fernald.*

BOTANICAL EDUCATION

C. Stuart Gager, *Editor*

Arthur H. Graves, *Assistant Editor*

(See also in this issue Entries 4108, 4335, 4361, 4367, 4374, 4502, 4525, 4526, 4433)

4132. Anonymous. **11-roller cane crushing plant presented to Imperial College of Tropical Agriculture, Trinidad.** Internat. Sugar Jour. 26: 573. *1 pl.* 1924.—A complete cane-sugar factory, in which students may learn the process of sugar manufacture, is being erected at the Imperial College of Tropical Agriculture. The cane crushing mill is described in detail.—*Nellie E. Fealy.*

4133. Anonymous. **The British Sugar-beet Society's activities.** Internat. Sugar Jour. 26: 459. 1924.—As a result of the new development of a British sugar-beet industry, the educational side of the subject is arousing considerable interest. The British Sugar-beet Society has invited representatives from certain educational institutions to join its committee in formulating a plan for the establishment and maintenance of a beet-sugar school in which students will be trained for technical posts in the industry. Theoretical training will be given in the universities, and practical training in the factories during the manufacturing season. The Dutch interests which contributed to the success of the Cantley and Kelham factories promise assistance in training Englishmen for the higher posts.—*Nellie E. Fealy.*

4134. Anonymous. **The Imperial College of Agriculture, Trinidad.** Internat. Sugar Jour. 26: 460–461. 1924.—Amazement is expressed at the comprehensive nature of the curriculum of the college, in which "every conceivable need appears to have been thought of and provided for." The institution has teachers who have been drawn largely from the Imperial Department of Agriculture in the West Indies. Its students include not only natives of the contributory islands, but also students, many of them graduates, from colleges of the old country. It is believed that this personnel represents the necessary elements which constitute the difference between success and failure. The hope is expressed that in time the needs of the different parts of the tropical Empire will be catered to by a series of similar colleges "on the spot."—*Nellie E. Fealy.*

4135. Blomquist, Hugo Leander. **A laboratory manual of general botany.** *58 p. Illus.* Trinity College Press: Durham, North Carolina, 1924.

4136. Edwards, Charles Lincoln. **Nature-study. Part I. Sense education, soil, plants and animals of the home neighborhood, mammals of the circus, sea shells and animals who make them.** *xi–231 p.* Hesperian Press: Los Angeles, 1924.

4137. Foster, Frank K. **The status of the biological sciences in the accredited high schools of the State of Washington.** School Sci. and Math. 24: 407–423. 1924.—This is a quantitative study of the subject based upon returns from 155 schools. It gives data upon courses offered, enrolment, training of teachers, and combinations of subjects taught.—*W. L. Eikenberry.*

4138. Jordan, Edwin O. **A text-book of general bacteriology.** *8th rev. ed. 752 p. Illus.* W. B. Saunders Co.: Philadelphia and London, 1924.

4139. Kemp, Emma L. **A herbarium of city trees.** Gen. Sci. Quart. 9: 7–9. 1924.—Experience has shown the value of having high school classes in general science prepare a tree herbarium as an aid to the recognition of city trees.—*L. A. Kenoyer.*

4140. National Geographic Society, Washington, D. C. **The book of wild flowers; an introduction to the ways of plant life, together with biographies of 250 representative species and chapters on our state flowers and familiar grasses; with color plates of 250 familiar wild flowers and grasses.** *243 p. Illus.* National Geographic Society: Washington, D. C., 1924.—In this book the following sections appear: Exploring the mysteries of plant life, by W. J. Showalter; Our state flowers, by G. Grosvener; Familiar grasses and their flowers, by E. J. Geske and W. J. Showalter; and Plant biographies, by W. J. Showalter.—*Frederick V. Rand.*

4141. Robbins, E. B., and Joseph C. Ireland. **Agriculture for high schools.** *v + 410 p. Illus.* Turner E. Smith Co.: Atlanta, Georgia, 1924.

4142. Smallwood, William Martin. **A text-book of biology for students in general, medical and technical courses.** *5th rev. ed. xv + 393 p. Illus.* Lea & Febiger: Philadelphia and New York, 1924.

4143. Smith, J[ohn] Warren. **Agricultural meteorology. The effect of weather on crops.** *xxiv + 304 p. 8 pl., 88 fig.* Macmillan Co.: New York, 1920.—"This book is designed primarily for university and college students, but it is entirely practicable for agricultural high schools, and for farmers' reading courses . . . The text is the outgrowth of over thirty years in climate and crop work in different sections of the United States, and fifteen years' contemporary instruction in meteorology and agricultural meteorology at the Ohio State University."—The chapter headings follow: (1) Introductory meteorology; (2) Agricultural meteorology; (3) Agricultural climatology; (4) Correlation; (5) Climate and crops; (6) Climate and farm operations; (7) Weather and crops; (8) The effect of weather on the yield of grains; (9) On vegetables and miscellaneous crops; (10) Weather forecasts and warnings; (11) Frost and the protection of crops from frost damage; and (12) The value of lightning-rods.—The work includes a detailed table of contents and an index.—*Frederick V. Rand.*

4144. Szabo, Z. **A növények életmódja.** [The mode of life of plants.] *154 p. Fig. 1–42.* Edit. Szent István Társulat, Szent István könyvek No. 29: Budapest, 1925.—This little book, written in a popular way, deals with growth, and with the external relations and internal structure and physiology of plants.—*Istvan Györffy.*

CYTOLOGY

Gilbert M. Smith, *Editor*

(See also in this issue Entries 4304, 4306, 4361, 4410, 4411, 4422, 4425, 4588, 4749, 4806, 4821)

4145. Accoyer, H. **Coloration vital et post-vitale du chondriome et des vacuoles des cellules de l'epithélium choroïdien chez le rat blanc.** [Vital and post-vital staining of chondriome and the vacuoles of the cells of the choroid epithelium of the white rat.] Compt. Rend. Soc. Biol. **91**: 665–667. 1924.

4146. Benians, T. H. C. **A further investigation into the principles underlying Gram's stain, with special reference to the bacterial cell membrane.** Jour. Path. and Bact. **23**: 401. 1919–1920.—The factors underlying the Gram stain are inherent in the physical structure of the bacterial cell and are not conferred upon it by the mordant. The capacity of retaining the compound dye by the Gram positive cells is related to the physical characters of the cell and is chiefly dependent on the structure and integrity of the limiting membrane. The Gram negative bacteria examined are of 2 types as regards the cell membrane: (a) Those that allow the attachment and probably the permeation of methylene blue and victoria blue; and (b) those to which these dyes are only peripherally adsorbed. Gonococci approximate the Gram positive organisms in so far as they contain the dye, but the absence of the specific cell membrane does not permit of the retention of the dye when alcohol is applied. The latter group are represented in this investigation by the coli-like bacilli.—*Ella M. A. Enlows.*

4147. Bloch, Robert. **Über das "Mesekret" von Ilex aquifolium.** [The "Mesekret" of Ilex aquifolium.] Ber. Deutsch. Bot. Ges. **42**: 255–261. 1924.—The author studies the "Mesekret" or oil drops in the mesophyll of *Ilex aquifolium.* These increase with age. He found that these drops are not waste material, as formerly supposed, but that they take part in the formation of cuticle or cork. The movement progresses so slowly that there is always an abundance of material in the mesophyll.—*Hally Jolivette Sax.*

4148. Chatton, Edouard, and Robert Weill. **Sur l'appareil flagellaire des Péridiniens et en particulier du Polykrikos schwartzi et ses relations avec l'appareil nucléaire.** [The flagellary apparatus of the Peridineae, especially of P. schwartzi, and its relation to the nuclear apparatus.] Compt. Rend. Soc. Biol. **91**: 580–583. *3 fig.* 1924.

4149. Dehorne, Armand. **Observations sur les cellules sphéruleuses à corps réfringent des Enchytraeides (Oligochètes). Ressemblances avec les formations myéliniques.** [Ob-

servations on the spherulose cells in the refringent bodies of Enchytraeides (Oligochetes). Their resemblance to myeline formations.] Compt. Rend. Acad. Sci. Paris 179: 1079–1081. 1924.

4150. Hosselet, C. **Sur l'hypoderme et son chondriome dans le genre Cyclops.** [The hypodermis and its chondriome in the genus Cyclops.] Compt. Rend. Soc. Biol. 91: 567–569. *3 fig.* 1924.

4151. Martens, P. **Le cycle du chromosome somatique dans Listera ovata.** [The cycle of the somatic chromosomes of Listera ovata.] Compt. Rend. Acad. Sci. Paris 179: 1280–1282. 1924.—The chromatin bipartition is neither the result of an alveolization of the filament, nor of the individual partition of chromatic particles linearly disposed. The chromatin element displays its filamentous nature in the 1st stages of prophase; and there are neither plates of chromatin, nor walls of vacoules or alveoli, as in telophase. The chromosomes do not present the "gaine" formation described by Bolles-Less or Metz. They do not form a continuous spireme. The observations and arguments recently used in support of polar subsidence do not appear valid. The actual condition of the chromatin in the resting nucleus is to be regarded as reticular-filamentous.—*C. H. Farr.*

4152. Mirande, Marcel. **Sur les propriétés optiques des stérinoplastes et de la phytostérine des bulbes du lis blanc.** [The optical properties of sterinoplasts and the phytosterine of bulbs of the white lily.] Compt. Rend. Acad. Sci. Paris 179: 986–989. 1924.—The normal sterinoplasts and the spherocrystals into which they are transformed are negatively birefringent. The direction of the greater optical elasticity is radial; of the less, tangential. The sterinoplasts are not amorphous organites, but possess a physical structure analogous to the imbibition forms of liquid crystals. The concretionary sterinoplasts and the blocks of concretionary sterine of the dry scales are positively birefringent. Sterine is highly refringent because of its high state of dehydration. It is prismatically crystalline in structure.—*C. H. Farr.*

4153. Parat, [M.], et J. Painlevé. **Observations vitale d'une cellule glandulaire en activité. Nature et rôle de l'appareil réticulaire interne de Golgi et de l'appareil de Holmgren.** [Observations on living active glandular cells. The nature and the role of the internal reticular apparatus of Golgi and of the apparatus of Holmgren.] Compt. Rend. Acad. Sci. Paris 179: 612–614. *Fig. 1–8.* 1924.

4154. Parat, M., et J. Painlevé. **Appareil réticulaire de Golgi, trophosponge de Holmgren et vacuome.** [The reticular apparatus of Golgi, the trophosponge of Holmgren, and the vacuome. Compt. Rend. Acad. Sci. Paris 179: 844–846. 1924.—The conceptions of Bensley and Henneguy are confirmed, and the results of the work of Guilliermond and Mangenot on plant cells are thus extended to animal cells. The reticular apparatus of Golgi or the trophosponge of Holmgren result from a precipitation of silver or of metallic osmium on the interior, on the periphery, or in the interstices of the protoplasmic vacuoles.—*C. H. Farr.*

4155. Pascher, A. [Rev. of: Gicklhorn, J. **Ein einfache Method zur Darstellung der Geiseln mit Basalkorn bei Flagellaten, besonders bei Eugleninen.** (A simple method for demonstrating the flagellum with its basal granule in flagellates, especially in euglenoids.) Zeitschr. Wiss. Mikrosk. u. Mikrosk. Technick. 38: 123–129. 1921.] Arch. Protistenk. 48: 525–526. 1924.

4156. Petit, Albert. **Observations cytologiques sur le Bacille du charbon et la Bacille diphtérique.** [Cytological observations on the anthrax Bacillus and the diphtheria Bacillus.] Compt. Rend. Soc. Biol. 91: 522–524. *8 fig.* 1924.—The anthrax Bacillus differs markedly in its structure from other Bacilli. At every stage of its development there is a homogeneous cytoplasm without chromatic granules and with only 1–2 vacuoles per cell. The prespore appears *de novo* in the cytoplasm. This leads to the conclusion that the chromatic granules seen in other bacteria and thought to represent a diffuse nucleus are only products of nutrition and do not help to form the spore. It is possible, however, that the chromatin, if it exists in bacteria, is intimately mixed with the cytoplasm and is precipitated to form the prespore.—All the chromatin granules described by others in the diphtheria Bacillus seem to correspond to metachromatin granules. This structure points to a relation between the diphtheria Bacillus and the higher Fungi.—*Oran Raber.*

4157. Plimmer, H. G., and S. G. Paine. **A new method for the staining of flagella.** Jour. Path. and Bact. 24: 286. 1921.—Ten gm. of tannic acid, 18 gm. of aluminum chloride, 10 gm. of zinc chloride, and 1.5 gm. of rosaniline hydrochloride are triturated in a mortar by the gradual addition of 40 cc. of 60% alcohol. After 1 minute almost complete precipitation occurs, the small amount left in solution appearing to be a balanced colloid. This, when applied to the bacterial film for 60 seconds becomes adsorbed by the flagella. The bacteria are next washed in running water and counterstained with phenol fuchsin (cold) or methylene blue for 5 minutes.—*Ella M. A. Enlows.*

4158. Ruhland, W., und K. Wetzel. **Der Nachweis von Chloroplasten in den generativen Zellen von Pollenschläuchen. [The demonstration of chloroplasts in the generative cells of pollen tubes.]** Ber. Deutsch. Bot. Ges. 42: 3–14. *Fig. 1–9.* 1924.—Chlorophyll was found associated with the generative cell in the pollen tube of *Lupinus luteus.* The origin and transmission of chloroplasts is discussed.—*Karl Sax.*

4159. Schaede, R. **Über die Reaktion des lebeden Plasmas. [The reaction of the living plasma.]** Ber. Deutsch. Bot. Ges. 42: 219–223. 1924.—The most careful technique is necessary in working with living protopasm, 0.004% (1–25000) methyl red alone or with traces of citric, succinic, oxalic, malic, tartaric, salicylic, hydrochloric, sulphuric, nitric, or phosphoric acids, are not, however, injurious to the protopasm of the onion. The dead protoplasm is permeated by the coloring solution while the living protoplasm has a tendency to store it. Living protoplasm in the onion gives a basic reaction with methyl red, dead protoplasm and cell sap an acid reaction. The same is true of ethyl red. The author suggests that the dead protoplasm may not be acid in itself but may be rendered so by the cell sap. He realizes that no general proof for the basal reaction of living protoplasm has been reached.—*Hally Jolivette Sax.*

4160. Schoenebeck, B. **Die Antipodenvermehrung der Typhaceen. [The increase of antipodals in the Typhaceae.]** Ber. Deutsch. Bot. Ges. 42: 296–299. *Fig. 1–5.* 1924—In the Typhaceae there is an increase in the antipodal cells just after a number of free endosperm nuclei are formed. Less of this tissue is developed here than in *Sparganium.* The cytological evidence places the Typhaceae next to the Sparganiaceae.—*Hally Jolivette Sax.*

4161. Schürhoff, P. N. **Zur polyembryonie von Allium oderum. [On polyembryony in Allium oderum.]** Ber. Deutsch. Bot. Ges. 40: 374–380. 1922.—About 20% of seed of *Allium oderum* contain 2 embryos. A cytological examination of the embryo sac showed that the extra embryo developed from the nucellar tissue near the antipodal end of the embryo sac and contained 2 X chromosomes.—*Karl Sax.*

4162. Schwemmle, J. **Vergleichend zytologische Untersuchungen an Onagraceen. [Comparative cytological studies in Onagraceae.]** Ber. Deutsch. Bot. Ges. 42: 238–243. *Pl. 1.* 1924.—The author is in accord with previous investigators in believing that the reduction divisions in certain Oenotheras are telosynaptic. In *Epilobium*, which belongs to the same family, the reduction divisions are parasynoptic.—*Karl Sax.*

4163. Tchang, Li Koue. **L'origine des inclusions graisseuses chez quelques Algues. [The origin of fatty inclusions in certain Algae.]** Compt. Rend. Soc. Biol. 91: 263–265. 1924. —In *Vaucheria*, *Spirogyra*, and *Cladophora* the fat globules appear directly in the cytoplasm and there they grow in size. Under certain conditions they may become accidentally attached to the chromatophores and thus give the appearance of having originated there.—*Oran Raber.*

4164. Wilson, Edmund B. **The cell in development and heredity.** *3rd. revised and enlarged ed. xxxvii + 1232 p. 529 fig.* The Macmillan Co.: New York, 1925.—Even with more than a doubling of the number of pages of the 2nd edition published in 1906 the author recognizes the "necessarily scant treatment accorded to many important topics." The rewriting of the book has involved an expansion of the 9 chapters of the 2nd edition to 14 and a trebling or quadrupling of the bulk of many of the topics treated in the 2nd edition.—Topics treated include: General morphology of the cell, 90 p.; cell division, 90 p.; reproduction and the life cycle, 28 p.; the gametes, including origin, growth and differentiation of the germcells (animals) and gamete formation (plants) 134 p.; fertilization, parthenogenesis and related phenomena, 91 p.; maturation and reduction, meiosis, 89 p.; reproduction and sexuality

of lower organisms, 48 p.; some aspects of cell-chemistry and cell-physiology, 35 p.; some problems of cell organization, 69 p.; chromosomes and sex, 83 p.; morphological problems of the chromosomes, 85 p.; heredity and the chromosomes, 60 p.; growth, cell-division and development, 52 p.; development and heredity, 83 p.—Each of the topics mentioned above is provided with a special literature list and in addition all citations are gathered in 1 comprehensive literature list. A glossary and author and subject indexes are included.—*Gilbert M. Smith.*

ECOLOGY

Geo. D. Fuller, *Editor*

(See also in this issue Entries 4015, 4046, 4088, 4091, 4102, 4111, 4114, 4119, 4122, 4124, 4126, 4140, 4143, 4144, 4225, 4283, 4285, 4294, 4298, 4299, 4304, 4427, 4445, 4466, 4482, 4556, 4781, 4791, 4801, 4813)

GENERAL, FACTORS, MEASUREMENTS

4165. Allen, W. E. **Quantitative studies on the marine phytoplankton at La Jolla in 1919.** Univ. California Publ. Zool. **22**: 329–347. *2 fig.* 1922.—The measured water method was adopted as standard and also the surface level as the standard level. Water currents seem to affect in a pronounced fashion the phytoplankton production. Certain common forms of wide distribution such as *Nitzschia seriata* Cl. and *Prorocentrum micans* Ehr. may serve as indicators of general conditions of the ecologic complex, while other less abundant forms such as *Asterionella japonica* Cl. and *Dinophysis homunculus* may serve as indicators of more special conditions.—*Wm. Randolph Taylor.*

4166. Gabriel, Cyprien. **Recherches sur la biologie d'une Algue volvocacée. [The biology of a volvocaceous Alga.]** Compt. Rend. Soc. Biol. **91**: 307–308. 1924.—*Brachyomonas submarina* Von Bohlin was described in 1897 but since that time has been found very rarely and only where the seawater has been much diluted by fresh water. In general it is found between concentrations of 1.2–1.8 gm. of NaCl per l. In a concentration of 0.18 gm. per l. it lived only 5 days.—In cultures its optimum was found to be 2.0 gm. per l. As the amount of salt increased the phototropism became more and more negative; as the water was diluted it again came to the surface.—These experiments show why it has been so seldom found. When looked for at the bottom of the port and canal it was found even where the water was very salty. When rains dilute the surface waters it is found at the surface and readily seen. During these periods it multiplies rapidly and then sinks into a period of inactivity as the water becomes more saline again.—*Oran Raber.*

4167. Hansen, Adolph. **Die Pflanzendecke der Erde. [The plant covering of the earth.]** *viii + 276 p., 24 fig., 1 map.* Bibliographische Institut: Leipzig and Vienna, 1920.—This is a general discussion largely from the floristic viewpoint of the vegetational covering of the earth. Part 1 is introductory in nature, dealing first with the history of the subject then with general floristic problems. The influence of man on the flora, the ecological interpretation of growth forms, the principal formations and the influence of climatic and edaphic factors are discussed in some detail. Part 2 considers the different regions of the world in the following order: (1) Arctic, (2) Europe giving especial emphasis to the plant geography of Germany, (3) Asia, (4) Africa, (5) America including both continents, and (6) Antarctic regions. These are subdivided into the more important formations and the physiographic, climatic and floristic features of each are briefly outlined. A map adapted from Drude is included.—*M. B. Morgan.*

4168. Jackson, V. W. **A standard method of plant survey for agricultural forecast.** Sci. Agric. **4**: 352–357. 1924.—With the basic facts of altitude, latitude, longitude, temperature, moisture and evaporation known for the district as a whole, other factors of a local nature may be best determined by a detailed quadrat or small area survey. The best standard area for spring and fall and for mixed vegetation such as scrub or shrub land, woodland or transitional zone is 0.01 acre. Equipment should include 2 flexible white cords 28 yards long, a dibble for soil sampling, soil reaction test outfit, thermometers, hatchet, and a standard

record card. A line survey or transect is best for areas of sudden changes in the vegetation. On open prairie or short-grass plains the square m. quadrat affords sufficient detail. A number of plant indicators are listed, and the importance of plant succession is briefly discussed.—*T. G. Major.*

4169. Karl, J. **A növényföldrajz mai állása. [The modern viewpoint in plant geography.]** Zsebatlasz és Magyar Földrajzi évkönyv [Editio: Magyar Földrajzi Intézet r. t. Budapest] **1924:** 90–101. 1924.

4170. Klugh, A. Brooker. [Rev. of: Lundegårdh, Henrik. **Pflanzenökologische Lichtmessungen. [Light measurements in plant ecology.]** Biol. Centralbl. **43:** 404–431. *10 fig.* 1923 (see following entry).] Ecology **6:** 82–84. 1925.—The reviewer criticizes the lack of data regarding the color sensitivity of the photographic film used, the lack of spectrophotometric data on the optical system of the apparatus, of information regarding the effectiveness of the "neutral wedge," of knowledge as to how the milk glass affects the quality of the light and of the spectral transmission of the filters. He concludes that "from data given in his paper, it would appear that the instrument will give a continuous record of the rays of short wave length of a habitat, but that it will give no accurate data of total light intensity or on the spectral quality of the light."—*Geo. D. Fuller.*

4171. Lundegårdh, Henrik. **Pflanzenökologische Lichtmessungen. [Light measurement in plant ecology.]** Biol. Centralbl. **43:** 404–431. *10 fig.* 1923.—The photometer, which is described in this paper, consists essentially of a wooden or metal box containing a drum, driven by clockwork, which makes a revolution in 7 days, and which carries the sensitive paper or film, and of a neutral wedge situated in a chamber through which the light enters, the chamber also containing 2 sheets of milk-white glass to diffuse the light. Above the upper milk glass is a slit, the aperture of which can be changed to accommodate the instrument to different ranges of light intensities and on this glass a color filter can be placed when desired. When light of high intensity is to be measured, either printing-out paper or developing paper (used as a printing-out paper, i.e., without development) is employed; while for work with low intensities, or where measurements are to be made at short intervals, either developing-paper or film is used and the photograms subsequently developed. The records are then read against a series of "standard tones," made on the same sensitive material on which the records are taken by a constant light source. When it is the intention of the investigator to measure the relative intensity of the shorter and longer wave-lengths a rotating disk (which makes a revolution every 15 minutes) is inserted between the 2 sheets of milk glass. This disk has 2 sectors cut out and over one of these openings a yellow filter is fixed. The object of this arrangement is to divide the spectrum into 2 parts (blue-violet and red-green) and to register alternately the intensity of these 2 kinds of light. Data obtained with this instrument, using Gevaert cine film, in several habitats are presented. These data are given in 2 ways, either as the red-green and the blue-violet light separately, or as the quotient of rg/by. Values for red-green light are also given for an Oxalis association and for the open, the readings being made synchronously, and for 3 Oxalis associations, 1 dark with sun-flecks present, the 2nd dark without sun-flecks, and the 3rd very dark with light-flecks. The average rg/by quotient in an Oxalis association for July 14, is given as 2.42, for August 23 as 3.02 and for September 5 as 3.40. The rg/by quotients for above and below potato plants from 1 o'clock until 8 are given as 1.8 for the former and 2.7 for the latter.—*A. Brooker Klugh.*

4172. Melin, Elias. **Die Phosphatiden als ökologischer Faktor im Boden. [Soil phosphatides as ecological factors.]** Svensk Bot. Tidskr. **18:** 460–464. 1924.—Hausteen Cranner has recently shown (Meld. Norges Landbrukshøiskole 1922) that all parts of plants secrete phosphatides (fat-like bodies that contain phosphoric acid and nitrogen) in analytically determinable quantities. They occur in considerable quantities in humus and in water with rich vegetation and play probably a large role in determining the micro-flora of natural soils. The author concludes that the mycorhizal fungi in his cultures were influenced by secretions (probably phosphatides) from the roots of the trees. This induced him to investigate the influence of phosphatides on mycorhizal fungi and on some other soil fungi (*Boletus variegatus, B. luteus, M. R. silvestris* β and γ, *M. R. Abietis, M. R. atrovirens, Rhizoctonia silvestris,* and

Mucor Ramannianus). The phosphatides were obtained from seed of spruces and pines, partly germinating, by a method to be described in a future paper. The growth of the fungi, especially the mycorhizal fungi and the formation of enzymes as shown by the formation of ammonia or organic nitrogenous substances were greatly stimulated by these phosphatides. The phosphatides apparently have chiefly a stimulating, not a nutritive effect, and hence must have a great influence on the micro-organisms in the soils and be of considerable ecological importance. Work is still in progress.—*O. Heilborn.*

4173. Osborn, T. G. B., and J. G. Wood. **On some halophytic and non-halophytic plant communities in arid South Australia.** Trans. and Proc. Roy. Soc. South Australia **47**: 388–399. *Pl. 35, 36. 2 fig.* 1923.—Proceeding toward the north, coincident with a decrease in the amount and the reliability of the rainfall, the eucalypts were replaced by associations of Chenopodiaceae. Salt content of the soil was not high, and water retaining capacity was about 36%. In halophytic communities Salicornieae were dominant.—*Wm. Randolph Taylor.*

4174. Osborn, T. G. B., and J. G. Wood. **On the zonation of the vegetation in the Port Wakefield district, with special reference to the salinity of the soil.** Trans. and Proc. Roy. Soc. South Australia **47**: 244–254. *Pl. 20.* 1923.—Rainfall was 12.34 inches for 12 months. Soils were a red sand and a clay mixed with shells and shell debris. Moisture and also salt content decreased progressively from the sea inland. In succession from the sea the following types of vegetation are met: *Avicenna officinalis; Arthrocnemum arbuscula; A. halocnemoides; Atriplex paludosum.* and *A. stipitatum.* The salt and water content typical of the different plant groups is tabulated and comparison made with conditions in the western U. S. A. —*Wm. Randolph Taylor.*

4175. Plantefol, L. **Le problème écologique pour l'Hypnum triquetrum L. [The ecological problem of Hypnum triquetrum.]** Compt. Rend. Acad. Sci. Paris **179**: 1067–1079. 1924.—The geographical distribution of mosses is determined by the relation of meteorological conditions to the hydration of the moss. A study is made of the water content and aqueous charge, the latter being the percentage of water to dry weight. This ranges from 1100 to 300 under ordinary conditions to 19.7 for dry and 1109 for rainy conditions. Heavy dew causes a variation from 32.8 to 96.9 and moist air from 19.7 to 29. Water loss accompanies drying of air or lowering of barometric pressure.—*C. H. Farr.*

4176. Salisbury, E. J. **The change in habitat of certain plants.** Veröffentlichungen Geobot. Instit. Rübel Zürich **1**: 285–288. 1924.—Species are cited that occur as calcicoles in both Britain and Switzerland, others that are calcifuges in both countries and still others like *Silene nutans, Carlina vulgaris* and *Galium cruciatum* that are calcicoles in Britain but occur in either siliceous or calcareous soils in Switzerland. Some calcicoles of Switzerland appear indifferent in Britain such as *Arcotstaphylos uva-ursi, Carex rupestris, C. humilis* and *Thalictrum alpinum.* A discussion of these and similar examples seems to indicate that in the interaction of soil and climate different factors may in different localities become of greater or less importance in determining the survival of the species.—*Geo. D. Fuller.*

4177. Schade, A. **Die kryptogamischen Pflanzengesellschaften an den Felswänden der Sächsischen Schweiz. [The cryptogamic plant societies on the precipices of Saxon Switzerland.]** Ber. Deutsch. Bot. Ges. **41**: 49–59. 1923.—Three plant groups are distinguishable on the sand stone rocks—those of (1) the damp mountain rocks, (2) the transition rocks, and (3) the dry mountain rocks. There is a gradual transition from one group to another.—*Hally Jolivette Sax.*

4178. Spencer, James H. **Our climate.** *2nd ed. enlarged. 47 p. 12 pl., 14 fig.* Issued by the Maryland State Weather Service: Baltimore. 1924.—The 1st edition has been slightly revised and enlarged by including sections on wind velocity, fog, and wind-barometer indications. Eight additional illustrations of cloud forms have also been added as well as tables showing the average monthly and annual precipitation and temperature at each of the co-operative weather stations in Maryland and Delaware.—*Earl S. Johnston.*

4179. Tits, D. -A. **Les zones altitudinales de végétation dans les Pyrénées orientales. [The altitudinal zones of vegetation in the eastern Pyrenees.]** Bull. Soc. Roy. Bot. Belgique **57**: 31–50. *5 fig.* 1924.—This portion of the Pyrenees attains a height of slightly over 2,000 m. and presents very varied climatic conditions not however departing from the periodic

Mediterranean type. The zones distinguished are the littoral and alpine at the extremes while between lie those characterized by the olive, by the beech, by the oak, by *Pinus sylvestris* and by *P. montana* var. *uncinata* respectively. Rainfall and temperature are plotted and lists of plants given for each zone. Attention is directed to the influence of climate and altitude on the physico-chemical character of the soil and to the important role of exposure in determining the vegetation of the various slopes.—*E. De Wildeman.*

STRUCTURE, BEHAVIOR, SYMBIOSIS

4180. Ames, Oakes. **Notes on New England orchids.—II. The mycorrhiza of Goodyera pubescens.** Rhodora 24: 37–46. *Pl. 135, 136.* 1922.—Admitting the proofs published by Knudson that orchid seed may be germinated under artificial conditions without the invasion of the embryo by a supposedly symbiotic fungal organism, the author attempts to discover if such germination takes place under natural conditions. From his own observations he had come to believe that endotrophic mycorhiza are influential not only in germination under natural conditions but that they influence the manner of local occurrence of species. In an endeavor to throw light on these matters the habits of *Goodyera pubescens* R. Br. were watched. The conclusion is that only those seed which fall where mycorhizal fungi are most likely to be present come to successful germination; the seed which blow and fall where there is no nidus of the necessary fungus failing to germinate. In the early stages of development the protocorms are leafless white bodies exhibiting all the phenomena associated with the presence of endotrophic fungi. The fungus lives in the protocorm; but as the rhizome, leaves and roots develop it passes into the cortical cells of the roots and does not again invade the tissue of the rhizome. From this and other evidence the author is not ready to admit that orchid-fungus symbiosis is simply the result of combat in which orchids have nearly balanced matters and then degenerated. In discussing the prodigality of seed-yield (as many as 1,756,440 seed in one capsule) the author suggests that this does not mean that the orchids are of low organization but that the abundant seed are necessary because of the peculiarities of the symbiotic relations that sprang into existence when an intrusive fungus became a helpful partner in the economy of the ancestral orchids. For every dozen seed that fall where endotrophic fungi of the proper type are present, millions must drift to sterile ground and suffer extinction.—*M. L. Fernald.*

4181. Fassett, Norman C. **An Epilobium under estuarine conditions.** Rhodora 26: 48, 49. 1924.—*Epilobium glandulosum* var. *ecomosum* n. var., a plant with no trace of coma on the seed (the distinguishing character of the tribe *Epilobiae*), occurs in tidal flats of the St. Lawrence River. Comparisons are made with peculiar modifications of other plants under estuarine conditions and the suggestion is made that the loss of the coma may be an adaptation to these conditions, a normally wind-disseminated species becoming water-disseminated.—*M. L. Fernald.*

4182. Latour, B. **Association vitales des champignons avec d'autres végétaux. [The association of fungi with other plants.]** Nat. Canadien 51: 40–46. 1924.—This is a popular statement of the commensal relation between green plants and the parasitic fungi. Numerous examples of lichens, root tubercles and root fungi are given.—*A. H. MacKay.*

4183. Salisbury, E. J. **The effects of coppicing as illustrated by the woods of Hertfordshire.** Trans. Herts Nat. Hist. Soc. 18: 1–21. *7 fig.* 1924.—Studies are made of the changes of light intensity in a wood coppiced in a 20 year rotation and the resulting changes in the shade and marginal flora. After coppicing, the shade flora shows diminished vigor and other species are able to invade its habitat, thus coppiced areas have an enormous increase in the number of species which occupy the ground. The story of a coppiced wood is thus a continual rise and fall in the vigor of the shade flora accompanied by an ebb and flow of the marginal flora.—*Geo. D. Fuller.*

4184. Sterner, Rikard. **Om Ölands flora. 1. Orobanche purpurea Jacqu. funnen på Öland. [Flora of Öland. 1. O. purpurea Jacqu. on Öland (A Swedish island).]** Svensk Bot. Tidskr. 18: 465–468. *1 fig.* 1924.—The species on *Achillea millefolium* is new for the Scandinavian countries. It has probably been introduced with German clover seed.—*O. Heilborn.*

4185. Wood, J. G. **On transpiration in the field of some plants from the arid portions**

of South Australia, with notes on their physiological anatomy. Trans. and Proc. Roy. Soc. South Australia. 47: 259–278. *Pl. 21.* 1923.—The plants studied were *Casuarina lepidophloia* (F. v. M.) *Geijera parviflora* (Lindl.), *Pholida scoparia* (R. Br.) *Atriplex vesicarium* (Hedw.), *Kochia sedifolia* (F. v M.), and *Rhagodia Gaudichaudiana* (Moq.). The graphs show temperature, evaporating power and light intensity, and transpiration. The plants fall into 3 groups; (1) *Casuarina*, with a high rate; (2) *Geijera* and *Pholidia*, with a low rate; and (3) *Atriplex*, *Rhagodia* and *Kochia*, with a rate apparently independent of physical conditions.—The anatomy of these plants is discussed; water storage tissue is reported for the *Casuarina* and a new type of water absorbing hair in *Kochia.—Wm. Randolph Taylor.*

FLORISTICS

4186. Allan, H. H. **Spartina-grass and its introduction into New Zealand.** New Zealand Jour. Sci. and Tech. 7: 253–256. *2 fig.* 1924.—Clumps of *Spartina Towsendii* and *S. stricta* were planted on the Foxton mud-flats, North Island, New Zealand, in 1913. *S. Towsendii* apparently has not become established, but *S. stricta* has thrived, 1 clump measuring, in May 1924, some 14 m. by 7 m. At this date seed of *S. Towsendii* were sown. Competition between the *Spartina* clumps and certain indigenous plants is likely to ensue.—*H. H. Allan.*

4187. Boros, A. **Ujonnan bevándorölt amerikai gyom hazánkban. [A recently introduced American weed.]** Természettudományi Közlöny [Budapest] 56[2]: 96–97. 1924.—The author reports concerning the introduction of *Ambrosia artemisifolia* in the comitaten Somogy, Zala u. Veszprem, where G. Lengyel, together with the author, have observed it many times.—*Istvan Györffy.*

4188. Braun-Blanquet, J. **Ueber die Genesis der Alpen flora. [Origin of the alpine flora.]** Verhandl. Naturf. Ges. Basel 35[1]: 241–261. *1 fig.* 1923.—Influenced by Christ many phytogeographers agree on the Tertiary origin of alpine flora. The original alpine flora probably came from the plains of southern or central Europe or from the mountains of the Balkans and Spain. Among the Tertiary endemics found in the Cottian and See Alps are representatives of the genera *Berardia*, *Wulfenia*, *Palderota*, *Iberis*, etc. A former connection between the Pyrenees, Provence and Corsica is indicated by a series of parallel species of *Saxifraga.* Species of Eurasian origin are seen in the Rosaceae, *Primula*, *Gentiana* and *Soldanella.* Endemic genera of the Mediterranean stock form 80% of the endemics of the Alps. The retreat and return of the alpine flora upon glaciation is discussed. Many details are given regarding the contributions to the alpine flora from the Mediterranean basin, from Asia, from the North and from the Atlantic coast.—*C. E. Hartt.*

4189. Britton, Elizabeth G. **The fringed gentian.** Torreya 24: 102–103. 1924.—*Gentiana crinita* Froel. has been successfully replanted by George F. Norton over a wide area in Eastern New York, by Mrs. Caspar T. Sharpless near Mt. Pocono, Penn., and by Miss E. R. Kennaday in Bergen Co., New Jersey and Dutchess County, New York.—*J. C. Nelson.*

4190. Chodat, Lucie. **Contributions à la géo-botanique de Majorque. [The geobotany of Majorca.]** Thesis No. 734. *116* p. *Fig. 1–37.* Univ. of Geneva: Geneva, 1924.—Almost the entire surface of the island is covered by an improverished garique that resembles the undergrowth of a forest of *Pinus halepensis* rather than an independent formation. The almost complete absence of *Quercus coccifera* is notable. In moist valleys and in more acid habitats there develops a maquis of *Erica arborea*, *Cistus monspeliensis* and *Arbutus Unedo.* Other minor communities are described and lists of plants given for each. The entire flora consists of 1250 spp. of which 80% seem to owe their presence on the island to man and domestic animals. The 61 endemic species thus constitute a very large percentage of the truly native flora. This flora is more closely related to the eastern Mediterranean region than to Spain. A freely annotated list of characteristic and endemic species is given. The author describes as new the species *Arum majoricense* and *Viola Barceloi;* the varieties *Digitalis dubia* Rodrig. var. *Rodriguezii* and *Aristolochia Bianori* Sennen et Pau var. *Knochiana;* and the forms *Anthyllis Vulneraria* L. var. *rubiflora* DC. f. *subunifoliata* and *A. Vulneriaria* var. *rubriflora* f. *insularis.—C. E. Hartt.*

4191. Chodat, R. **L'Endémism alpin et les réimmigrations post-glacial. [Alpine endemism and post glacial reimmigration.]** Verhandl. Naturf. Ges. Basel 35: 69–82. *Fig. 1.*

1923.—The Swiss Alps probably contain no endemic Linnaean species. Many rare species are connected with forms in the Italian Alps at the south. Some common plants migrated into the Swiss Alps from the south after the retreat of the glacier, some of which had previously been driven south by the oncoming glacier. Since glacial times no Linnaean species have appeared in the Swiss Alps, but many elementary species have become differentiated. The varieties of *Sempervivum tectorum* L. hybridize freely, giving sterile hybrids. Three constant, easily distinguished forms derived from *Matthiola tristis* R. Br. (a Mediterranean sp.) are found in Maurienne, in graie Alps and Valais: *M. vallesiaca* Gay., *M. pedemontana* Conti, *M. sabauda* Chod. For *Hieracium*, Swiss endemism is only of an order lower than the variety. The "cucullata" form of *Taraxacum officinale* is easily distinguished from *T. alpinum* Koch., *T. officinale* Web. and *T. laevigatum* DC.—*C. E. Hartt.*

4192. Fries, Harald. **Växtlokaler från Göteborgs och Bohus län. [Plant localities of Gothenburg and Bohus (Sweden).]** Svensk Bot. Tidskr. **18**: 430–441. 1924.—The paper contains an extensive list of plant localities.—*O. Heilborn.*

4193. Fröman, I. **Spridda bidrag till "Stockholmstraktens växter." [Flora of the neighborhood of Stockholm.]** Svensk Bot. Tidskr. **18**: 511–513. 1924.—It contains a list of plant localities.—*O. Heilborn.*

4194. Hennen, J. **Plantes subspontanées observées dans les environs immédiats d' Anvers. [Naturalized plants in the vicinity of Anvers.]** Bull. Soc. Roy. Bot. Belgique **57**: 28–30. 1924.—In a list of 72 introduced species there are some that have persisted since 1884. So abundant have certain species become that the author was able to collect in 1 day for pharmaceutical purposes 20 kilos of the roots of *Chelidomium majus*, 28 of *Solanum dulcamara*, 12 kilos of *Hyoscyamus niger*, 32 of *Datura stramonium* and 18 of *Chamomilla officinalis*.—*E. De Wildeman.*

4195. Jansson, Arvid. **Tillägg till "Stockholmstraktens växter." [Flora of the neighborhood of Stockholm.]** Svensk Bot. Tidskr. **18**: 507–510. 1924.—It contains a list of plant localities.—*O. Heilborn.*

4196. Martin, W. **Native plants of Dunedin and the surrounding district.** *37 p. 18 fig.* Otago Daily Times and Witness Newspapers Co.: Dunedin, 1924.—An account is given of the localities and habitats in which the indigenous species that occur near Dunedin, New Zealand, are to be found. The matter is classified according to the plant communities and the growth-forms of the species mentioned.—*H. H. Allan.*

4197. Mattfeld, Joh. **Die Grundlage und das Wesen des "Age and Area" und "Size and Space" Gesetzes von Willis. [The basis and nature of Willis' laws of "Age and area" and "Size and space."]** Bot. Jahrb. **59**: 183–197. 1924.—The 1st law of Willis is to the effect that, other things considered, the older a species or group the wider will be its area of distribution. The 2nd law is a corollary of the 1st, stating that the larger the area of a species the older is that species. The author holds that these theories are not well founded. It is noted that, as many students of plant geography have shown, there are 2 kinds of endemics, one kind consisting of old species in process of extinction, and the other of new species of limited range. This distinction Willis seems not to have noted. It is also pointed out that the distribution in New Zealand, one of Willis' examples of his theory, can be explained as well or better by the effect of climate. The author notes that the deductions from Willis' tables are a result of the way in which the tables are formed. It cannot be concluded from Willis' tables, as he does, that species cannot have arisen by gradual alteration. Neither can the general statement be made that the portion of a genus having the widest distribution is the oldest. A bibliography is appended.—*K. M. Wiegand.*

4198. Megaw, W. R. **Mosses of Rathlin Island.** Irish Nat. **33**: 144. 1924.

4199. Palmer, Ernest J. **The ligneous flora of Rich Mountain, Arkansas and Oklahoma.** Jour. Arnold Arboretum **5**: 108–134. 1924.—The author gives a general topographic and geological description of that part of the Ozark region which is situated south of the Arkansas River and includes Rich Mountain. The flora of Rich Mountain which is a mountain range with a sharp and narrow summit is described in detail and this description is followed by an annotated systematic enumeration of the trees and shrubs observed on that mountain. The forest flora of this region consists chiefly of species of the Coastal plain to the south and the

xerophytic plants of the western and southwestern plains which constitute a conspicuous feature of the typical Ozark region are absent. A new species, *Hypericum oklahomense*, is proposed.—*Alfred Rehder.*

4200. Peattie, Donald Culross. **The Atlantic coastal plain element in the flora of the Great Lakes.** Rhodora 24: 57–70, 80–88. 1922.—By the coastal plain flora is meant the flora of that area of acid bogs, sand barrens, savannahs and marshes anywhere from the Gulf of Mexico and Florida to Cape Cod, Nova Scotia and Newfoundland. Soil and other controlling conditions of the coastal plain are duplicated at various points in land, especially along the Great Lakes and on some of the lakes of New York. Typical ranges are mapped and discussed and it is pointed out that the coastal plain plants which characterize the Great Lakes have not come up the Mississippi but are intrusions by way of the old shores of the Hudson-Champlain estuary, Lake Iroquois, Lake Algonquin and other shores of the Algonquin stage of Wisconsin glaciation. The concentration of many coastal plain types at the head of Lake Michigan, nearly 1000 miles from the Atlantic, is believed to be due to specially favorable conditions there, these plants being largely species which inhabit ponds, pond-margins and lagoons. In general the coastal plain types persist only where these younger and less-permanent features of the shore erosion cycle are still to be found. The coastal plain plants follow the receding shores of lakes and prepare the ground for the forest types of the adjacent country. This pioneering quality of the coastal plain type is taken as one proof of their early migration around the glacial lakes. It is significant that the stations for coastal plain isolations along the Great Lakes are precisely where spits and lagoons still exist. The connections of the Algonquin stage through central Ontario and the Ottawa Valley are today marked by the presence of coastal plain types. The sand hills of the Illinois River contrast with the sands of the Great Lakes in having several species which seem to have intruded from the coastal plain of the Mississippi basin. A table shows the Great Lake stations of coastal plain plants.—*M. L. Fernald.*

4201. Praeger, R. L. **Southern plants in Eastern Ireland.** Irish Nat. 33: 97–98. 1924.

4202. Rheder, Alfred. **Enumeration of the ligneous plants of northern China, II.** Jour. Arnold Arboretum 5: 137–224. 1924.—This part deals with the families from Lardizabalaceae to Rosaceae and, like the preceding part, consists of an annotated enumeration with the citation of the specimens seen and those recorded from northern China. The following species, varieties and combinations are new: *Philadelphus laxiflorus; Deutzia parviflora* var. *micrantha* (Engl.); *Ribes emodense* and its varieties *urceolatum*, (Jancz.), *glandulosum* (Jancz.) and *verruculosum;* Rosa *rugosa* var. *Chamissoniana* f. *rubro-plena; R. bella* var. *mongolica* (Franch.); *R. xanthina f. spontanea; Prunus Davidiana* var. *Potanini* (Batal.); and *P. triloba* f. *multiplex* (Bge.) and f. *simplex* (Bge.).—*Alfred Rehder.*

4203. Reiche, K. **Consideraciones estadisticas sobre la flora y la vegetacion del Valle de Mexico.** [**Statistical notes on the flora of the Valley of Mexico.**] México Forest. 2: 111–114. 1924.—In this area of 2400 sq. km., between 19° 12′ and 19° 37′ north latitude and 0° 15′ east and west of the cathedral in Mexico City, there are approximately 1500 species of spermatophytes. The ratio of dicotyledons to monocotyledons, 1150: 338, or 3.4: 1, is the same as in other regions. Of the 114 families of angiosperms, 94 are dicotyledons. Sixteen families are represented by 20 or more species each, and 29 by only 1 species in the district. The Compositae lead with 319 species, followed by Gramineae with 162, Leguminosae 93, and Solanaceae 44. There are 208 species of grasses and grass-like plants. The characteristics and composition of the flora as a whole are described.—*W. N. Sparhawk.*

4204. Salisbury, E. J. **Changes in the Hertfordshire flora: a consideration of the influence in man.** Trans. Herts Nat. Hist Soc. 18: 51–68. 1924.—Some 14 spp. have shown increasing frequency of occurrence, 45 spp. have exhibited a diminished frequency and 33 spp. have probably become extinct. These species are listed and discussed.—*Geo. D. Fuller.*

4205. Setchell, W. A. **Cape Cod in its relation to the marine flora of New England** Rhodora 24: 1–11. *Pl. 133.* 1922.—After a discussion of the views of Farlow, Collins and others, it is shown that the southern species do not stop abruptly at Cape Cod but are often found in warm areas to the north, while some boreal species occur in cold areas to the south. Of the species on the coast of New England 24.5% are found exclusively to the north, 20.5% ex-

clusively to the south of Cape Cod, the remainder passing the Cape in one direction or the other. Analyses of these figure are given, showing that Cape Cod is not so distinctly a dividing line as was supposed by W. H. Harvey. These analyses are followed by a discussion of the zonal relation of the marine floras of Cape Cod, with the conclusion that the district between Chatham (at the elbow of Cape Cod) and New London and Montauk Point on the west belongs so far as its sheltered waters are concerned to the North Subtropical Zone, while the outer waters belong to the North Temperate Zone.—*M. L. Fernald.*

4206. Smith, Harry. **Bidrag till Torne Lappmarks flora. [Contributions to the flora of Torne Lappmark (northern Sweden).]** Svensk Bot. Tidskr. **18**: 442–450. 1924.—This contains a list of plant localities with some introductory remarks. *Draba crassifolia* and *stellaria longipes* are reported as new for Sweden. *Antennaria glabrata* is also noteworthy, being first found in Sweden by Th. Fries and afterwards by the author.—*O. Heilborn.*

4207. Täckholm, G. **Floristiska bidrag från Bo socken. [Flora of the parish Bo (near Stockholm).]** Svensk Bot. Tidskr. **18**: 514–518. 1924.—It contains a list of plant localities. —*O. Heilborn.*

4208. Vestergren, T. **Apera interrupta (L.) P. B. (Agrostis interrupta L.), en sydlig xeroterm på Ölands och Gotlands hällmarker. [A. interrupta (L.) P. B., a southern xerotherm on the flag-stone grounds of Öland and Gotland (Sweden).]** Svensk Bot. Tidskr. **18**: 469–480. *4 fig.* 1924.—The author found that specimens of *Apera spicaventi* var. *pygmaea* Fr. collected on the islands Öland and Gotland are really *Apera interrupta* (L.) P. B. A detailed description is given of the species which is rare on Gotland but rather common on southern Öland. Outside of Sweden it occurs in western, middle and especially Mediterranean Europe, western Asia and northern Africa, everywhere rare. Notes are also given on *Apera intermedia* Hackel, a species not found in Sweden. Lists of the localities outside of Sweden of both species are given.—*O. Heilborn.*

VEGETATION

4209. Adamson, R. S., and T. G. B. Osborn. **The ecology of the Eucalyptus forests of the Mount Lofty Ranges (Adelaide District), South Australia.** Trans. and Proc. Roy. Soc. South Australia **48**: 87–144. *Pl. 10–20.* 1924.—The region comprises a mountain range with a general elevation of 1500 feet, the highest peak being 2,234 feet. The soils show diverse sandy and gravelly types and 80% of the 20–40 inches of rainfall comes in the cool months from April to October inclusive. Three types of vegetation are distinguished: (1) The "Stringy bark formation" is a broad sclerophyll forest of the most continental type with an undergrowth of rather xerophytic undershrubs developing where the rainfall exceeds 30 inches. It consists of 2 consociations dominated by *Eucalyptus obliqua* and *E. capitellata*, respectively, the earlier stages in the succession being *E. fasciculata* forest and *Casuerina stricta* scrub. Edaphic areas are occupied by low forests of *Eucalyptus eleaophora* or a scrub of *E. cosmophylla*. The scrub of this formation is said to closely resemble the maquis of the Mediterranean region. (2) The "Savanna woodland formation" has a rainfall of 20–30 inches and the trees form a very open forest with herbaceous grass-like undergrowth. Two sub-formations are dominated by the blue gum, *E. leucoxylon* and the peppermint, *E. odorata*, respectively. Other species of *Eucalyptus* are mingled with these in varied edaphic situations. (3) The "Red gum formation" occurs on riversides and wherever underground water is present near the surface. In it the red gum, *E. rostrata*, forms a nearly pure stand of large spreading trees rather close together with a ground cover of small herbaceous plants. The relationship of these formations, their variations, their extent and their secondary species are discussed and good photographs of them are reproduced. Native and introduced species are listed for each community.—*Geo. D. Fuller.*

4210. Alechin, W. **Assoziationskomplexe und Bildung ökologischer Assoziationsreihen. [Association complexes and the formation of association series.]** Bot. Jahrb. **59**: 30–40. *6 fig.* 1924.—From a study of ecological series on a periodically inundated meadow in Tambow (Russia?) the author has classified the "Komplexes" into 5 types and has devised means of illustrating them by maps and formulae. As special results of the study the following points are mentioned: Several "pure" ecological series occur in the inundated area,

though more often mixed series were found; associations of a series may drop out; the best method of constructing ecological series is the "Komplex" method; the great variations in the complexes may be reduced to 4 fundamental types.—*K. M. Wiegand.*

4211. Collins, Marjorie. **Studies in the vegetation of arid and semi-arid New South Wales. I. The plant ecology of the barrier district.** Proc. Linn. Soc. New South Wales **48**: 229–266. *Pl. 15–23, 6 fig.* 1923.—The arid area of the continent is estimated as 37% of the whole. The Barrier District occurs near the eastern limits of the arid country and has less than 10 inches of rainfall. The geologic, physiographic and climatic features of the district are sketched. Among the prominent features of the vegetation are sclerophyllous leaves of the long narrow type, spinescence on a small scale, clothing hairs and succulence among the under shrubs, and reduct on of leaves and phyllodia in many species. The umbrella type of small tree and shrub is extensively developed. Tall trees are few, Ephemerals are abundant in the ground flora and often of dwarf mat form. The main types of vegetation are: (1) The "Mulga scrub," a rather close formation in which the "mulga," *Acacia aneura*, is associated with other species of *Acacia*, *Eremophila*, *Dodonaea* and *Hakea* with occasional communities of "oak," *Casuerina lepidophloia*, "mallee," *Eucalyptus oleosa*, and "pine," *Callitris robusta*. This covers the hills and hill slopes, varying considerably in luxuriance and density; and (2) the "salt bush association," an open community of small scrubs among which *Atriplex vesicariam* is associated with *Kochia* spp., *Rhagodia spinescens* and an annual flora of Compositae, Cruciferae, Papilionaceae and others which appear after the rains. Variations and successional stages of these types are discussed.—*Geo. D. Fuller.*

4212. Collins, Marjorie. **Studies in the vegetation of arid and semi-arid New South Wales. II. The botanical features of the Grey Range and its neighborhood.** Proc. Linn. Soc. New South Wales **49**[2]: 1–18. *Pl. 4–9.* 1924.—The hills of this range extend from New South Wales into Queensland at about Lat. 30°S. and Long. 140° 50′E., have a height of 400–500 feet and are surrounded by sandy plains. The rainfall is 4–12 inches. The vegetation is similar to that of the Barrier District. (See preceding entry.) Indeed the Acacia steppe characterized by the "mulga," *Acacia aneura* together with *Acacia* spp., *Eremophila* spp. and *Cassia* spp. seems worthy to be regarded as the climax vegetation of that part of New South Wales having 6–10 inches of rainfall. A list of species collected is given.—*Geo. D. Fuller.*

4213. Decary, R. **Monographie du district de Tsihombe. IV. Météorologie. V. Botanique. [Meteorology and botany of the district of Tsihombe.]** Bull. Econ. Madagascar **18**[1]: 5–29. *3 pl.* 1921.—The extreme south of the island is included in this district. The xeromorphic features of the vegetation such as thick and succulent leaves, reduced foliage, succulent stems, spines and thorns are emphasized and an annotated list of species is given.—*Geo. D. Fuller.*

4214. Hastings, George T. **Water plants of the Kanawauke Lakes.** Torreya **24**: 93–97. 1924.—These 3 lakes are situated in the Palisades Interstate Park, between Rockland and Orange Counties, New York. Only the First Lake is natural; the Second and Third have been formed by damming. The plant distribution in the 3 is far from uniform, 37 vascular species being found in the First Lake, 24 in Second and 16 in Third, although a free current connects the 3. The algal flora is much greater in the Second and Third Lakes. Lists are given of flowering species collected, of which 16 are common to all 3 lakes, 8 are found in First and Second Lakes, and 13 in First Lake only.—*J. C. Nelson.*

4215. Hauman, Lucien. **Un viaje botanico al Lago Argentino (Patagonia). [A botanical trip to Lake Argentine.]** An. Soc. Cien. Argentina **89**: 179–281. *Pl. 1–9, fig. 1–12.* 1920.—This article describes the vegetation of Patagonia between 45°–52°S. The major portion of the region is covered by the "Patagonian Steppe Formation" passing on the north into the "Monte Formation" characterized by low trees and shrubs with species of *Larrea*, *Prosopis*, *Gourliea*, *Acacia* and *Schinus* dominant. The steppe vegetation seen on the plains that extend from the Atlantic coast rising by low benches to an altitude of 250 m. is developed in a climate with 100–400 mm. of rain, rather low temperature—that of the summer seldom exceeding 20°C.—and rather constant high winds. The vegetation consists of a few low prostrate shrubs such as *Berberis heterophylla*, *Verbena tridens* and *Nardophyllum Kingii*, rarely over 50 cm. high, a fairly abundant development of a few grasses such as *Bromus macranthus*,

Danthonia picta, D. trisetum, Stipa humilis and *S. patagonica,* and, even more abundant and characteristic than the grasses, a series of low rosette and mat plants belonging to such families as the Compositae, Valerianaceae, Umbelliferae, Cruciferae, Caryophyllaceae, Frankeniaceae, Verbenaceae and Solonaceae. The rosette and mat forms are similar to those of alpine slopes and often develop a continuous covering on the plains (meseta). In protected valleys the vegetation is more abundant and grasses are better developed. In the west there is a transition through the foothills to the Magellan forest which lies in the protecting folds of the mountain slope. This forest is dominated by *Nothofagus pumilo, N. antarctica* (both deciduous), *Drymis Winterii* and *Librocedrus tetragonia,* and seems to resemble the temperate deciduous forests of North America rather than the rain forests of Chile. Above the forest is an alpine vegetation in which rosette and mat forms are abundant. Minor communities of the stream valleys and lake shores are also described. The bibliography contains 50 citations.—*Geo. D. Fuller.*

4216. Hill, Albert F. **The vegetation of the Penobscot Bay region, Maine.** Proc. Portland [Maine] Soc. Nat. Hist. 3: 305–438. *Fig. 1–50.* 1923.—This region with the characteristics of a drowned coast is situated midway between the eastern and western boundaries of the state. The soils are chiefly of glacial origin and very meagre. The underlying rocks are predominantly acidic, granite being of most frequent occurrence. The climax forest is a mixture of deciduous and coniferous species. The characteristic trees include *Acer saccharum, Fagus grandifolia, Tsuga canadensis, Betula lutea, Pinus Strobus, Abies balsamea, Picea mariana* and *Picea rubra,* while the shrubby undergrowth consists primarily of *Acer pennsylvanicum, Acer spicatum* and *Viburnum alnifolium.* The succession on igneous rocks usually results in a spruce-fir forest, on glacial drift in a deciduous climax, while on sedimentary rocks a pine stage is usually present. Sea bluffs are frequent and often have a characteristic growth of prostrate shrubs at their crest, though the coniferous forest may extend to the very edge of the cliffs. If the exposure is extreme, barren headlands may occur with a carpet of grasses, or low shrubs, and rarely of stunted trees. Beaches are either of the shingle or gravel type, the former often occurring as barrier beaches, and their vegetation displays no unusual features. Secondary successions on uplands resulting from cultivation, fire or lumbering are extremely common and have greatly altered the nature of the existing vegetation. Old fields and pastures are eventually reclaimed by a forest of spruce and fir or in sandy places by *Pinus Strobus.* Blueberry barrens, maintained by frequently burning over a locality, are of increasing prominence. After a hardwood is cut off it is followed by either a sprout growth or by conifers. A coniferous forest is usually succeeded by a bramble stage and a birch poplar wood before conifers again return. In well-drained lakes and lake-swamps stages occur leading to a swamp forest, which rarely may be a Thuja swamp. In undrained swamps a bog forest is the culminating type; while spring swamps may ultimately be covered by a swamp forest.—*Author.*

4217. Jackson, V. W. **Vegetational succession in the Red River Basin.** Sci. Agric. 4: 301–307. 1924.—Until quite recent times the greater part of the province of Manitoba was covered by water. The gradual receding of the water leaves a succession of vegetational zones. An example of this is found in the Red River Delta where all stages from lake to prairie may be seen. In some parts a very rapid lowering of the water-level takes place, always giving a quick succession of mesophytic ruderals like sow thistle. The layers of alluvium or clay indicate that, except along the river banks, trees have invaded the prairie land within the last hundred years. The greater part of this Basin is emerging from a meadow-grass and shrub-island stage, and entering upon a poplar-shrub-preclimax. Everything points to a Poa-Symphoricarpus-Compositae poion as the Red River dryland prairie climax, rather than a deciduous hardwood forest climax. The value of a plant survey as an indicator of future arable land is pointed out, and a glossary of ecological terms appended.—*T. G. Major.*

4218. Noulens, J. **Monographie de Nossi-Be. V. Flore. [Monograph of Nossi-Be. V. Flora.]** Bull. Econ. Madagascar 18[4]: 80–87. 1921.—This province of Madagascar comprises the northwestern portion of the island, originally rather completely covered with forests now largely cut. This article consists principally of annotated lists of species of economic importance.—*Geo. D. Fuller.*

4219. Osborn, T. G. B. **The flora and fauna of Nuyts Archipelago and the Investigator Group. No. 8. The ecology of Pearson Islands (with an appendix on the soils by J. G. Wood).** Trans. and Proc. Roy. Soc. South Australia 47: 97–118. *Pl. 4–9. Fig. 1.* 1923.—These small islands are 40 miles from the mainland and have an area of some 3 square miles with hills 781 feet high. A woodland of *Casuerina stricta* 20–30 feet high in rather open formation covers the more sheltered slopes of the hills. A scrub of *Melaleuca parviflora, Clearia ramulosa, Rhagodia baccata* and *Myoporum deserti*, having a rather open, character, covers much of the lower slopes. On other parts of the islands there is a salt bush community of *Atriplex paludosum* or a mat plant community of rather succulent plants such as *Chenopodium* and *Mesembryanthemum*. A list of 52 species is given, the Chenopodiaceae (10 spp.), Compositae (9 spp.) and Gramineae (5 spp.) being the most important families.—*Wm. Randolph Taylor.*

4220. Pax, Ferdinand, und Hubert Winkler. **Vegetationsbilder aus den Sudkarpathen. [Vegetation views of the South Carpathians.]** Vegetationsbilder 15^3: *19 p.* unnumbered. *6 pl.* 1924.—The meteorological conditions in the Carpathians are described. The flora comprises such elements as the middle European, the Siberian, the alpine, the Mediterranean, the Pontic and the Balkan. Representatives of these elements are cited and discussed. The large plates show (1) beech forest with *Vitis vinifera* in Osernavalley; (2) forest on the Summit of Domogled composed of *Pinus austriaca, Populus tremula, Carpinus orientalis, Fraxinus ornus* and *Syringa vulgaris;* (3) Transylvanian Alps with *Pinus pumilo* and *Juniperus nana;* (4) Transylvanian Alps with *Alnus viridis;* (5) Transylvanian Alps with *Veratrum nigrum;* and (6) *Sambucus ebulus* and *Ceterach officinarum.*—*J. C. Th. Uphof.*

4221. Perrier de la Bathie, H. **La végétation Malgache. [The vegetation of Madagascar.]** Ann. Mus. Colonial Marseille 3e. ser. 9: 1–268. *118 fig. 4 map.* 1921.—The vegetation of the island is excessively rich in species, the total number being about 5,000, and $\frac{3}{4}$ of them are endemic. The author divides the vegetation into 2 groups, that of areas exposed to humid winds and that of the leaward slopes where there is either no wind or it is dry. The former culminates in the luxuriant evergreen forests of the east, while the latter finds its best development in the deciduous forests along the borders of streams with scattered trees on the hills and plateaux. The eastern forest has an Asiatic affinity while the western and southwestern forests have an African affinity. An important characteristic of the eastern forest is the lack of dominant species. Of 100 plants growing side by side there will probably be 50 different species. The extreme north, the northwest and part of the west of the island are characterized by 5 months of rain and 7 months of almost absolute dryness. There are mesophytic forests on the borders of streams, somewhat xerophytic forests on the laterite and sandy hills and on the calcareous plateaux, and where the rainfall is very limited a growth of xerophytic scrub. In the southwest, rare and irregular rains have resulted in an extremely xerophytic native vegetation. When left undisturbed the vegetable covering of the island took care of itself, but with the advent of man its destruction began and has continued until now only about $\frac{1}{8}$ of the total area is covered by native flora. The forests have been cut and burned, erosion has increased until most of the island is a great sterile land covered by a monotonous prairie characterized by a poverty of species.—*M. B. Morgan.*

4222. Poisson, H. **Monographie de la province Tulear. II. Flore et géographie botanique. [Monograph of Tulear. II. Flora and geobotany.]** Bull. Econ. Madagascar 18^4: 52–68. *1 map.* 1921.—In this province of southwestern Madagascar the communities recognized and described are: (1) Mangrove swamps; (2) shore dunes with very scanty vegetation; (3) xerophytic scrub on sandy and calcareous soil; (4) forests on the lower hill slopes with *Tamarindus indicus, Cephalanthus spatheliferus, Sclerocarya coffra, Ficus* spp., and *Acacia* spp. as the principal trees; and (5) savannas characterized by *Heteropogon contortus, Hyphaene coriacea Adansonia Grandidieri.* An annotated list of the principal species, designated by both colloquial and scientific names, is given.—*Geo. D. Fuller.*

4223. Shantz, H. L., and Raphael Zon. **The natural vegetation of the United States.** U. S. Dept. Agric. Bur. Agric. Econ. Atlas of American Agriculture, Pt. I. Sect. E. *29 p. 60 fig., 3 maps.* 1924.—The most important feature of this publication is a vegetation map of the U. S. A. 15 × 25 inches, by the joint authors. On it is shown the distribution of 18 types of forest vegetation, 7 types of grassland and 3 types of desert shrub. The grassland and desert

shrub types are described by Shantz and the forest types by Zon. Very good photographs of the various types are well reproduced. The bibliography contains 100 citations.—*Geo. D. Fuller.*

4224. Taylor, Norman. **Vegetation of Long Island. I. The vegetation of Montauk. A study of grassland and forest.** Brooklyn Bot. Gard. Mem. 2: 1–107. *Fig. 1–30.* 1923.—A description of the vegetation at this easterly extremity of New York State reveals a contest between grassland and forest which the author ascribes to exposure to wind, and insufficient water on the higher sites. Instrumental data, including atmometer records covering 3 seasons, as well as Weather Bureau records, are given in detail to support the contention. Records of the moisture holding capacity and wilting coefficient (Briggs and Shantz method) of the soils show them to be as good as or better than other Long Island soils which support a forest. Besides the discussion of the environment, there are descriptions of the vegetation types, the early history of the Point as it affects the vegetation, a list of most of the species which occur there, and a statistical résumé of the systematic list.—*Helen S. Hill.*

FORESTRY

W. N. Sparhawk, *Editor*

(See also in this issue Entries 4008, 4059, 4091, 4120, 4183, 4199, 4209, 4211, 4212, 4215, 4216, 4218, 4219, 4220, 4221, 4222, 4223, 4224, 4397, 4565, 4591, 4592, 4640, 4691, 4718, 4753)

4225. Anonymous. **British Guiana.** (*4*) + *103 p. Illus. 1 map.* British Empire Exhibition: Wembley, 1924.—Chapters are devoted to the flora (p. 39–147), to the timber and forest industries (p. 48–58), and to the sugar, rice, and miscellaneous agricultural industries (p. 59–73).—*W. N. Sparhawk.*

4226. Anonymous. **Comment, au Canada, on cherche à protéger la forêt contre les incendies. [A means of forest fire protection in Canada.]** Jour. Forest. Suisse 73: 133–134. 1922.—The use of demonstration railway cars in forest fire protection propaganda is described by quoting from the Gaz. Agric. Canada, a journal published by the Minister of Agriculture at Ottawa.—*G. Kempff.*

4227. Anonymous. **The Imperial Forestry Institute, Oxford.** Australian Forest Jour. 7: 232–233. 1924.—Plans for organizing the new forestry training and research institute recently established at Oxford University are discussed.—*C. F. Korstian.*

4228. Albisetti, C. **La sistemazione idraulico-forestale dei bacini montani d'Italia. [Regulation of mountain watersheds in Italy by means of hydraulic works and forest planting.]** Jour. Forest. Suisse 73: 104–109, 127–131. *4 illus.* 1922.—The writer stresses the importance of supplementing engineering work with forest planting, in the control of torrents. He describes projects in 3 regions: (1) The headwaters of the Aterno, typical of the Apennines and foothills of the Alps; (2) the Rotolon branch of the Agno, typical of the Alps proper; and (3) the Quieto, representing the Karst region.—*W. N. Sparhawk.*

4229. Arlen. **Considérations sur la détermination de la possibilité des futaies jardinées. [Determination of the cut in selection high forests.]** Rev. Eaux et Forêts 59: 309–310. 1921.—The formula proposed in the Forest Service memorandum of July 17, 1883, assumes that the forest is normal; that the ages from 1 to n are evenly distributed and occupy equal areas; that the 3 groups (young, middle-aged, and old trees) are equal in area and in number of age-classes; and that the sizes of the trees correspond to their ages. The realization of the proportion 5:3 (volume of old trees to volume of middle-aged trees) implies equal areas of the 2 groups. But since for each species at its average age there is a certain relation between the crown space and the basal area, the basal areas of the middle-aged and old trees, or of any age-class, may be substituted for the total areas occupied by them. This makes it possible to determine the cut simply by a calculation of the basal areas, with certain advantages such as avoiding the errors due to the use of volume tables.—*S. T. Dana.*

4230. B[adoux], H. **Dimensions d'un pin du lord Weymouth centenaire renversé par le vent. [Dimensions of a wind thrown hundred-year old white pine (Pinus strobus).]** Jour.

Forest. Suisse 73: 133. 1922.—The tree was forked 6 m. above ground, had a D.B.H. of 80 cm., and a height of 36 m. at an age of exactly 100 years. Although the butt log was damaged in falling, the tree yielded 8 cu. m. of timber which brought a net return of 335 francs. —*G. Kempff.*

4231. B[adoux], H. [Rev. of: Chapman, H. H. **Forest mensuration.** *553 p. 87 fig.* John Wiley & Sons: New York, and Chapman & Hall: London, 1921 (see Bot. Absts. 12, Entry 1695).] Jour. Forest. Suisse 73: 120. 1922.—The reviewer questions the statement in article 342 that the current growth on stands can best be obtained from yield tables—a statement not tenable in the light of recent European works on this subject. [See also Bot. Absts. 12, Entries 398, 2345, 6293.]—*G. Kempff.*

4232. Badoux, H. [Rev. of: Piccioli, Lodovico. **Monografia del castagno. (Monograph of the chestnut.)** *2nd ed. 400 p. 150 illus., 1 map.* Florence. 1922.] Jour. Forest. Suisse 73: 118–120. 1922.—The 22 chapters describe at length the morphological characteristics of the genus *Castanea* (including all the known varieties); its distribution in Italy; its culture as a fruit and forest tree, the latter as coppice and saw-timber; its technology; and its enemies, animal and vegetative, especially the parasite *Blepharospora cambivora* Petri, which causes the dreaded "ink-disease."—*G. Kempff.*

4233. Bandekow. **Beiträge zur Buchenverjüngung aus dem Vollbestande. [Regeneration of beech without preparatory fellings.]** Deutsch. Forstzeitg. 39: 1169–1171. 1924.—To take advantage of the heavy mast in 1918, ⅓ of the timber was cut and the soil broken under several beech stands which had not been subjected to the usual preliminary fellings. Abundant reproduction resulted, although it has not grown as well on exposed south slopes as elsewhere.—*W. N. Sparhawk.*

4234. Barbey, A. [Rev. of: Biolley, H. E. **L'aménagement des forêts par la méthode expérimentale et spécialement la méthode du contrôle. (Management of forests by the experimental method and especially by the method of control.)** *90 p.* Attinger Frères: Paris and Neuchâtel, 1921.] Rev. Eaux et Forêts 59: 351–354. 1921.

4235. Bertin, A. **Les bois coloniaux. [Colonial woods.]** Rev. Eaux et Forêts 59: 373–382. 1921.—In the face of a world deficit of large timber, and with increasing wood importations which will shortly amount to more than 8 million cu. m. a year, valued at a billion francs, France can and should meet its needs from its own colonies. Exclusive of northern Africa, these contain about 90 million ha. of forest land. The Atlantic colonies of Ivory Coast, Gabun, Kamerun, and Guiana, with 59 million ha., are of greatest immediate importance because of their accessibility. Exploitation is not difficult; and in spite of the large number of species, about 40 comprise ⅔–¾ of the stand, with an average volume of 120 cu. m. of usable material per ha. Physical and mechanical tests have shown that the majority are comparable to such species as oak and fir. Arrangements are being made for an adequate trial of these woods in actual construction work as the 1st step toward their more extensive utilization.—In order to maintain the productivity of the colonial forests, it is essential that they be carefully managed by technical foresters. The rapid disappearance of mahogany and the transformation of the rich forests of the equatorial humid zone to useless brush give warning of the need for efficient forest management.—*S. T. Dana.*

4236. Billson, H. G. **Annual progress report of forest administration in the United Provinces for the period 1st April 1922 to 31st March 1923.** *ii + 2 + 38 + xciv + 4 p.* Allahabad, 1923.—This is the customary annual report of the activities of the Forest Department. Points of particular importance are: (1) The financial machinery of Government makes it difficult to run Government mills and wood-working plants; (2) the non-cooperative movement has made forest administration exceedingly difficult; (3) investments in railways and roads are necessary to secure utilization of many forests; (4) afforestation of denuded ravines is successful; (5) the taungya system of growing crops and sal is working well; (6) trespass increased; and (7) the shortage of Imperial Forest Officers continued. Detailed tabulations and a review of the entire report are given.—*S. B. Show.*

4237. Bøhmer, J. G. **Taksering av Norges skoger. IV. Nord-Trøndelag Fylke. [A forest survey of Norway. IV. North-Trøndelag province.]** Tidsskr. Skogbruk 32: 330–334. 1924.—A 0.2% estimate was made of this province to obtain volume, growth, and number

of trees, and the area distribution of the forests. Statistical checks on computations gave good results.—*W. H. Meyer.*

4238. Boros, A. **A somogyi sik erdöségei.** [**The forests of Somogy plain.**] Erdészeti Lapok **63**: 240–243. 1924.

4239. Brooks, Alfred H. **The value of Alaska.** Geog. Rev. **15**: 25–50. *Fig. 1–25. 3 maps.* 1925.—The paper discusses agriculture, reindeer pasture, forests, and utilization of resources. The resources of Alaska, Sweden, and Finland are compared. Maps show land classification, transportation and water power, and mineral deposits.—*S. B. Show.*

4240. Busse. **Wachsraum und Zuwachs.** [**Growing space and increment.**] Deutsch. Forstzeitg. **39**: 1187–1189. 1924.—A study of the sample plots established during the past 60 years in Saxony shows that pine and spruce stands originating from broadcast seeding have the smallest basal areas, heights, and volumes, while those resulting from seeding in furrows or spots have not done as well as planted stands. Sown stands should be thinned heavily when very young, in order to prevent stagnation of growth.—*W. N. Sparhawk.*

4241. Canada. Dept. of the Interior, Forestry Branch. **The forests of Canada. Their extent, character, ownership, management, products, and probable future.** (Prepared in cooperation with the Dominion Bureau of Statistics.) *45 p.* Ottawa, 1923.—"There are approximately 160 arborescent species of hardwoods and 31 coniferous softwoods in Canada, but only 23 species of softwoods and 32 species of hardwoods can be considered as commercially important. The conifers form over 80% of the standing timber and 95% of the lumber and pulpwood produced."—Of the estimated total forest area of 950,000 square miles, 25.82% is public land dedicated to timber production, 6.58% is in private ownership, and the rest is public land the ultimate disposition of which is awaiting examination and classification. "The policy of disposing of the title to lands fit only for the production of timber has been virtually abandoned in every province."—Existing forest legislation and regulations, administrative methods, and assistance given to private owners are summarized; the organization of the Dominion and provincial forest services, the professional and other forestry associations, and the forest schools are described; and detailed statistics of production and commerce are given.—The total stand of merchantable timber is estimated at 246.8 billion cubic feet, and the annual depletion at about 5.5 billion cubic feet. This includes 2.6 billion feet cut and 2.9 billion feet destroyed by fires, insects, fungi, and other agencies. Fire destroys annually about 800,000,000 cubic feet of merchantable timber on 723,250 acres, and the young growth on 1,300,000 acres. It is doubtful whether the annual increment exceeds the cut alone. The per capita consumption within the Dominion is equivalent to approximately 200 cubic feet of standing timber, nearly ½ being fuel wood.—A list of reports and publications dealing with Canadian forests is appended.—*W. N. Sparhawk.*

4242. Champsaur, G. **L'abies pinsapo dans les reboisements.** [**Reforestation with Abies pinsapo.**] Rev. Eaux et Forêts **59**: 333–337. 1921.—During the last ¾ century *Abies pinsapo*, orginally a native of the mountains of southern Spain, has been planted extensively in France, particularly in the south. Some vigorous specimens are now 20 m. in height and 2 m. in circumference. It may now be regarded as naturalized, at least in the low mountains of Mediterranean France and in the higher zone immediately adjacent. It should be planted more extensively there and should also be tried out in the mountains of northern Africa, which are similar in climate to the sierras of southern Spain. Besides having great aesthetic value, it grows well in all kinds of soil; forms a dense cover which excludes any under-wood; is easily raised in the nursery; may be planted with bare roots; and is resistant to drought, snow, and grazing.—*S. T. Dana.*

4243. Chapman, Herman H. and Robert B. Miller. **Second report on a forest survey of Illinois. The economics of forestry in the State.** Bull. Illinois Nat. Hist. Surv. **15**: 46–172. 1924.—The original and present forests are described. "While dominantly hardwood in character, yet conifers were found in the original forests. Cypress extended up the Ohio and Wabash rivers and along the lower Mississippi for several miles. . . . . One small grove of shortleaf pine occurs on the dry slopes of the westernmost bluff of Union County and another group . . . . in southeastern Randolph County. White pine grew along the river bluffs in several regions north of the Illinois River. . . . . The red cedar was found generally

throughout the State." "There is evidence that the forests were constantly endeavoring to encroach upon the prairie, but that annual fires . . . . served as a check upon the advance of the forest." The wooded area has been reduced from 15,588,965 acres to 2,863,764 acres, most of which has been cut over. Farmers own 93% of the total. The production and consumption of wood on farms are discussed, and the possibilities and advantages of growing timber as a crop on the existing woodland, as well as on some 2,000,000 acres of other hilly, sandy, or swampy land not suited for farming. Considerable space is given to a detailed discussion of the timber requirements of the State and the sources of supply. The Chicago district consumes 470 board feet of lumber per capita, towns outside of Chicago 297 feet, farms 272 feet, and the State as a whole 363 feet. The forests of Illinois produce only 2.4% of the lumber required, 65.8% of the fuel wood, and 32.7% of other timber products. A forest policy for the State is recommended.—*W. N. Sparhawk.*

4244. Clarke, Stanley A. **Air-seasoning test in Western Australia.** Australian Forest Jour. 7: 296–297. 1924.—This article discusses plans for tests to determine the rate of drying of 1-inch lumber, with reference to both locality and method of stacking.—*C. F. Korstian.*

4245. Coulon, P. de. **Jardinage cultural et méthode du contrôle. [Selection thinning and the control method.]** Jour. Forest. Suisse 73: 124–127. 1922.—This is a defense of an unhampered exercise of the forester's art in selecting the trees for retention or removal in thinning operations in selection forests. Citing from Biolley's book, "L'Aménagement par la méthode du contrôle," the writer draws 3 major conclusions: (1) that in making thinnings, the forester should be influenced only by the condition and appearance of the stand; (2) that the "control method" of stock-taking and reckoning of increment tends to confuse the practitioner; (3) that this method is of value only to the theorist, the amateur statistician, and the research worker at experiment stations.—*G. Kempff.*

4246. Duly, Sidney John (editor). **Timber and timber products, including paper making materials.** (Vol. 2 of **The resources of the Empire,** prepared by the Federation of British Industries.) With a foreword by H. R. H. the Prince of Wales, and general introductions by Sir Eric Geddes and Lord Lovat. *2 + 7–228 p.* Ernest Benn, Ltd.: London, 1924. —The book presents the results of inquiries made since 1919 into the forest resources of the British Empire. For each Colony or Dominion are given the available facts on extent and character of the forests; principal species; annual growth, cut, and consumption; exports and imports; forest and wood-using industries; and forest products other than timber. It is concluded that for the world as a whole, wood requirements have reached a stage where available supplies of virgin timber cannot be depended on for the future. This is particularly true of softwood (conifer) timber. The time has come for systematic study and exploitation of the tropical and semi-tropical hardwood forests. It is urged that all of the forests of the Empire be immediately put under the control of trained foresters, and that timber trade between the various parts of the Empire be developed in order to reduce as far as possible the dependence on foreign supplies. Imperial resources supply only 17% of the present requirements. British capital should be used to provide transportation facilities in the forested regions of the Empire, and also to provide logging, milling, and manufacturing machinery, and to develop markets for hardwoods and minor forest products which are not yet widely known. A 3-page bibliography is given.—*W. N. Sparhawk*

4247. Frothingham, E. H. **Forest research: The basis for sound development of North Carolina's forest industries.** North Carolina Forest. Assoc. (Unnumbered Publ.) *13 p.* 1924. —The value of the State's forest producing power is shown as is also the need for a plan-wise development of the forest resources.—*C. F. Korstian.*

4248. Gardner, C. A. **The forest formations of western Australia. No. 6. The mulga bush.** Australian Forest. Jour. 7: 256–259. 1924.—The type occurs in the dry interior of Western Australia. The flat country is sparsely timbered with mulga (*Acacia aneura*) and allied species—cork trees (*Hakea Cunninghamii*) and *Grevillea* spp. The economic importance of the mulga bush lies in the value of the herbaceous plants for forage and in the use of the mulga trees for firewood.—*C. F. Korstian.*

4249. Gautier, E. F. **The Trans-Saharan railway.** Geog. Rev. 15: 51–69. *Fig. 1–15.* 1925.—Palm plantations and cotton-growing are mentioned as factors in locating the railway.—*S. B. Show.*

4250. Gonggrijp, J. L. [W.]. **Verslag van een dienstreis tot het onderzoeken van de mogelijkheid tot afzet van Surinaamsch hout vooral in Midden-Amerika. [Report of a study on the possibility of disposing of Surinam lumber, especially in Central America.]** Dept. Landb. Nijverheid en Handel Suriname Bull. 46. *1–25 p.* 1924.—In the Saramacca canal in Surinam, at about 150 m. from the Demerara greenheart (*Nectandra Rodioei* Schomb.) sluicegates which were destroyed by *Teredo,* and at a place where this shipworm was very aggressive, as evinced by attacks on other timbers, manbarklak (*Eschweilera longipes* Miers.) piles standing in the water during 17 years were not attacked. At the mouth of the Nickerie River there are examples of manbarklak piling exposed to *Teredo* during 70 years and internally as sound as the day the piles were driven. It is suggested that all timbers containing a certain amount of silica particles and possessing certain hardness must be proof against *Teredo.* The silica grains probably blunt the teeth of the mollusk's boring apparatus. Silica grains are found in several Surinam timbers. The following are not attacked by *Teredo:* manbarklak, *Dicorynia paraensis* Benth., *Couepia* sp., *Licania macrophylla* Benth., *Parinarium campestre* Aublet., foengoe (*Parinarium* sp.), and bongo (*Parinarium* sp.). *Licania heteromorpha* Benth. is attacked in a slight degree, having an insufficient amount of silica grains.—*J. C. Th. Uphof.*

4251. Granger. **Apropos du budget des Eaux et Forêts. [The budget of Waters and Forests.]** Rev. Eaux et Forêts **59**: 369–372. 1921.—The low financial return from the national forests is due partly to undertakings such as reforestation in the mountains and in areas devastated by the war, from which no return can be expected for a long time; and partly to the payment by the State of the salaries of certain communal foresters, with no corresponding revenue from the communal forests. Allowing for such expenditures as these, the budget for 1921 indicates a net return of 25 francs per ha. or 2%. This relatively low yield is offset by the important influence of the forests on stream flow, climate, erosion, public health, scenery, and the national defense, and their part in the production of large sized native timber. The management of the national forests involves much more than a simple question of finance.—*S. T. Dana.*

4252. Gray, H. R. **Forestry and farming.** Australian Forest. Jour. **7**: 236–246. 1924.—Besides showing that forestry and farming may be carried on together, methods of planting and species are recommended for various soil and rainfall conditions.—*C. F. Korstian.*

4253. Grenning, V. **Pinus insularis.** Australian Forest. Jour. **7**: 200–204. 1924.—The characteristics and uses of Benguet pine of the Philippine Islands are described.—*C. F. Korstian.*

4254. Hamelinaye, H. de la. **Quelques observations sur les exploitations directes. [Some observations on direct exploitations.]** Rev. Eaux et Forêts **59**: 347–350. 1921.—The profits realized by timber merchants during the war and the present depression in stumpage prices have led many owners to manufacture and market their timber instead of selling it on the stump. While this has long been customary in the fir forests of eastern France, generally with good results, it is likely to prove more difficult in coppice-with-standards because of the greater variety of products and the greater uncertainty in marketing them. Two errors apt to be committed are overlooking various costs and overestimating the final product. The volume of boards sawed from the best grade of logs (clear, straight butt logs of oaks more than 1.2 m. in circumference at breast height) is at the most 70% of the gross volume of the logs, while for smaller or defective logs only 50% is realized. Because of the unsettled state of the market, it would be well for owners of oak who can do so to retain their holdings until the present economic crisis has passed.—*S. T. Dana.*

4255. Hawes, Austin F. **The work of a forest protective association.** *31 p. Illus. 1 map.* Hartford, Connecticut, 1924.—Following a discussion of forest fire damage in general, ways are outlined in which coöperative associations of owners can organize the work of protecting their forests against fires, diseases, and insects. A summary of the statistics of forest fires in Hartford County during 1910–1923 is appended.—*W. N. Sparhawk.*

4256. Hawley, L. F., L. C. Fleck, and C. A. Richards. **The relation between durability and chemical composition in wood.** Indust. and Eng. Chem. **16**: 699–700. 1924.—Hot and cold water extracts were prepared from 10 representative woods and the toxicity of these

extracts to *Fomes annosus* was determined. The following conclusions are drawn: (1) The hot water extracts were all more toxic than the corresponding cold water extracts, except where retardations were equal at 0 or 100%; (2) in all cases the sapwood extract was less toxic than the corresponding heartwood extract. The difference was so marked that in itself it explains the difference in durability between heartwood and sapwood; and (3) the relative resistance to decay of the woods examined can be largely explained by the toxicity of their extracts.—*Henry Schmitz.*

4257. Hawley, R. C., and P. H. Merrill. **Hemlock: its place in the silviculture of the southern New England forest.** Yale Univ. School Forest. Bull. 12. *1–68. Fig. 1–8.* 1924.—Hemlock has been largely eliminated from hardwood sprout forests of southern New England by cutting and forest fires, but where protection from fire is afforded, it is still an important component of the stand. Yields of pure, even-aged, 2nd growth stands of hemlock are around 32 cubic feet or 160–170 board feet per acre annually on the poorest quality of soil, increasing to 80 cubic feet or 450–500 board feet on the best sites. The percentage of hemlock in reproduction is much greater on grazed areas, due to removal of ground cover and reduction of competing hardwoods. Yield tables, volume tables and a discussion of the form of hemlock are included.—*H. H. Chapman.*

4258. Herrmann. [Rev. of: Ruzicka, Jareslav. **Die neuesten Erfahrungen über die Nonne in Böhmen.** (**Recent data on the nun-moth in Bohemia.**) Centralbl. Gesam. Forstw. **50:** 33 ff. 1924.] Deutsch. Forstzeitg. **40:** 31–33, 57–59. 1925.

4259. Hoar, H. M. **Tanning materials survey. Part III. Quebracho: The origin and growth of the industry and the significance of its control to the leather industry of the United States.** U. S. Dept. Commerce, Bureau of Foreign and Domestic Commerce, Trade Information Bull. 295. *1–32.* 1924.—The principal species of quebracho, from a tannin standpoint, are *Schinopsis Lorentzii* and *S. balansae*, which occur in commercial quantities in northern Argentina and in Paraguay. This bulletin describes briefly the quebracho forests, and the methods of logging, preparing the wood for market, and making tannin extract. The production, consumption, and export trade in the wood and extract are discussed, with a summary of prices for extract in Argentina and the U. S. A. Quebracho extract is one of the quickest vegetable tanning materials known. It is extensively used in tanning sole and sheepskin leathers, and to a less extent for other kinds. The best results are obtained by blending it with other tannins, such as those from oak, hemlock, or chestnut.—*W. N. Sparhawk.*

4260. Howard, Alexander L. **Burma mahogany.** Timber Trades Jour. **95:** 1799, 1801. *1 fig.* 1924.—"The golden hue of the pleasant-coloured reddish brown is enhanced and improved in appearance by the satiny lustre . . . that this new wood displays." The trees have long, straight boles, there is no sap wood, the grain is close and hard and is resistant to cold and to changes of humidity. "In plain, it is a valuable decorative art furniture wood of the very finest class."—*Frederick V. Rand.*

4261. Howard, Alexander L. **Laurel wood.** Timber Trades Jour. **95:** 1957–1958. *1 fig.* 1924.—The laurel wood of India, one of the finest woods in the world, was discovered only 4 years ago. The coloring is similar to Italian walnut but with greater variety of marking and figure. Used in the solid it stands up better than most other hard woods in both construction work and furniture. In working qualities it somewhat resembles Spanish mahogany.—*Frederick V. Rand.*

4262. Howard, Alexander L. **Pyinkado.** Timber Trades Jour. **96:** 13, 15. 1924.—Pyinkado, a species of acacia, is the iron-wood of Burma; in woodwork it hardens with age in so remarkable a manner that after a few years no tools can work it. It possesses great strength and durability and also a singularly oily and sticky quality, but it does not become slippery. It is no doubt the large quantity of oil which has made this wood so durable. Freshly cut wood is of a yellow-brown color, later becoming a rich salmon pink. The grain is close and compact; its weight being 62–86 pounds per cubic foot. This timber is now available in considerable quantities.—*Frederick V. Rand.*

4263. Howard, Alexander L. **Gurjun wood.** Timber Trades Jour. **96:** 172–173. *3 fig.* 1924.—The gurjun trees of India and Burma possess rather smooth, bluish-colored trunks whose great length, large size and fine quality make the timber exceptionally valuable. The

trees are practically without limbs and consequently knots do not occur. Dugouts are made from the trunks by the natives. The timber is very strong, and is useful for constructional and decorative purposes. It is said to retain and give forth a fragrant scent; floors made from it are as silent to the tread as linoleum; and a room panelled and furnished with it is cooler than the surrounding temperature. This wood gives greatest satisfaction when seasoned in scientific seasoning chambers.—*Frederick V. Rand.*

4264. Huffel, G. **Le mouvement forestier a l'étranger.** [Rev. of: (1) Flury, Philipp. **Untersuchungen über das Schwindmass des Stammholzes bei Winter- und Sommerfällung.** (The shrinkage of timber cut in summer and in winter.) Mitteil. Schweiz. Centralanstalt forst. Versuchsw. 11: 273–300. *Fig. 1–4.* 1921; (2) Burger, Hans. **Studien über die Anzucht und die Massen- und Gelderträge der Eiche in der Schweiz. I. Über morphologische und biologische Eigenschaften der Stiel- und Traubeneiche und ihre Erziehung im Forstgarten.** (Mit Vorwort von Arnold Engler.) (**Studies of oak in Switzerland. I. Morphological and biological characteristics of Q. pedunculata and Q. sessiliflora and their cultivation in forest nurseries.**) Mitteil. Schweiz. Centralanstalt forst. Versuchsw. 11: 301–377. *13 fig. 6 pl.* 1921.] Rev. Eaux et Forêts 59: 390–397. 1921.

4265. Jones, Chapin. **The administrative report of the Virginia state forester for the calendar years 1922 and 1923.** Virginia Geol. Comm., Office State Forester. Publ. 32 [31]. *1–53 p.* Charlottesville, 1924.—This is the routine report of the State Forester, with recommendations for amendments to the present forestry laws. Cooperative forest fire protection between the State, counties and Federal Government is stressed.—*C. F. Korstian.*

4266. Kaán, K. **Elvátozások az Alföld képében.** [**Changes in the Alföld.**] Erdészeti Lapok 63: 255–257. 1924.

4267. Kempski. **Die Forstwirtschaft Niederländisch-Indiens.** [**Forestry in the Dutch East Indies.**] *60 p. 40 fig.* Paul Parey: Berlin, 1924.—Java has 734,000 ha. of teak forest and 2,250,000 ha. of "wild" forest. The teak forest has been under management since 1865, some being handled according to detailed working plans and the rest less intensively. Of the wild forest, $\frac{2}{3}$ is definitely reserved and under a rough form of management. The forests of the Outer Possessions have been nominally under state control since 1917, though little work has been done except reconnaissance surveys. Sumatra has about 25 million ha. of forest; Dutch Borneo, 33 million; Celebes, 12 million; New Guinea and nearby islands, 30 million; and other islands, 3 million.—Teak is usually clear cut over areas of 10–15 ha., which are immediately reseeded, under a system of "Waldfeldbau." The young teak is thinned at 5 years, and every 5 years thereafter up to 50 years, then at 10 year intervals until maturity. The final cut is usually made at about 80 years, all trees being girdled 2 years in advance of cutting.—Considerable space is given to a discussion of forest products exported, and to a description of the game and other animals.—*W. N. Sparhawk.*

4268. Kerr, George A. **The quebracho forests of South America.** *27 p. 13 fig.* Pan American Union: Washington, D. C. 1924.—The extent and distribution of these forests in Argentina and Paraguay, their physical aspects, and methods of exploitation are described. —*W. N. Sparhawk.*

4269. Kovácsik, D. **Az erdö világa.** [**The world of the forest.**] *67 p. 12 pl.* Pub. by the author: Budapest, 1924.—The book was written with the object of awakening interest in forests. The beauty of the forests is pictured, and their utility is described; forest regulation and management and the enemies of foresty are discussed.—*Istvan Györffy.*

4270. Luban. **Zum Forleulenfrass.** [**Concerning the damage by the pine owl moth.**] Deutsch. Forstzeitg. 39: 1224–1225. 1924.—The writer cites experiments to prove his assertion (See Bot. Absts. 13, Entry 1319.) that blazing the trunks of defoliated trees helps their recovery.—*W. N. Sparhawk.*

4271. McKee, E. R. **The French turpentining system applied to longleaf pine.** U. S. Dept. Agric. Dept. Circ. 327. *1–16. Fig. 1–11.* 1924.—"Great and irreparable damage is being done to the 2nd growth longleaf pine [*P. palustris*] in parts of the South by destructive turpentining methods. This circular sets forth experiments carried on for 6 years in the Florida National Forest. The results . . . indicate that 2nd-growth longleaf pine can be worked profitably under the French system of turpentining, and that, for the permanent

welfare of the naval stores industry of the South, operators in 2nd-growth forests would do well to adopt the governing principles of the French system."—*Author's summary.*

4272. Matusovits, P. **Tölgyeseink pusztulásának okai és a védekezés. [Causes of devastation of our oak forests, and their protection.]** Erdészeti Lapok 63: 120–126. 1924.

4273. Mer, Emile. **De l'influence du dégagement des brins et de la coupe du taillis sur l'accroissement et la forme des baliveaux chênes. [Effect of cutting on the growth and form of oak standards.]** Rev. Eaux et Forêts 59: 301–308, 338–346, 384–389. *Fig. 1–2.* 1921.—A disengagement cutting was made in 1888 in a stand of coppice-with-standards, and the coppice was removed in the winter of 1893–1894. Measurements of 2 oak standards, 40 and 42 years old, 1 of which was pruned of adventitious branches in the fall of 1895 and the other left unpruned, and both of which were cut and sectioned in the spring of 1899, showed that: (1) the disengagement cutting prevented impoverishment of the crowns of the standards thus freed, and resulted in an increased volume growth of 29 and 30% in the 2 trees. (2) During the 5 years after the coppice was cut the volume growth of the pruned tree increased 50% and that of the unpruned tree 40%. (3) During the same period the pruned tree grew 61% faster in volume in the lower portion of the bole (up to 6 m.), and 25% faster in the upper portion (next 4 m.); in the unpruned tree the growth increased 70% in the lower and decreased 55% in the upper portion. (4) During the 3 years following pruning the rate of growth in the pruned tree increased by 46% in the lower portion of the bole, and decreased 18% in the upper; in the unpruned tree it increased 31% in the lower portion and decreased 50% in the upper. (5) Cutting thus made the boles of both trees, but particularly the unpruned one, more nearly conical.—The following measures are recommended: (1) About the middle of the 1st rotation, disengage the young standards of oak and other valuable species, and remove their lower dead and dying branches; (2) in the spring before the coppice is cut, double girdle the old oak standards which are to be cut, in order to protect their sapwood from worm holes; (3) two years after the cutting, remove adventitious branches from all of the reserved oaks.—*S. T. Dana.*

4274. Minnesota State Forestry Board. **Biennial report for the fiscal years ending June 30, 1924. 1923–1924.** *23 p.* Minnesota State Forestry Bd.: St Paul, 1924.—The report outlines the policy of the Board, reviews the activities of the State Forest Service for the period covered and closes with recommendations in regard to future appropriations, policy, etc. A summary of forest fire statistics for the calendar year 1923 and the 1st ½ of 1924, a comparison of the damage done and area burned for the years 1916–1923 and a financial statement for the 2 years are also included.—*J. A. Mitchell.*

4275. Moll. **Holzkonservierung und Schwammverhütung in landwirtschaftlichen Betrieben. [Wood preservation and fungus prevention in agricultural establishments.]** Mitteil. Deutsch. Landw. Ges 39: 344–345. 1924.—Practical methods of wood preservation are suggested.—*A. J. Pieters.*

4276. Mühlhausen. **Haubergswirtschaft im Kreise Siegen im 16. und 17. Jahrhundert. [Forestry in the Siegen district (Prussia) in the 16th and 17th centuries.]** Deutsch. Forstzeitg. 39: 1213–1214. 1924.—This is said to have been the earliest example of systematic continuous forest management.—*W. N. Sparhawk.*

4277. Oechslin, Max. **Les conditions forestières de la vallée d'Urseren. [Forestry conditions in the valley of Urseren (canton Uri).]** (French translation of an article in the Schweizerische Zeitschr. Forstw.) Jour Forest. Suisse 73: 131–132, 159–161. 1922.—The historical records begin with the 11th century and give an insight of early forest devastation, followed by an era characterized by protective laws and which culminated, at the end of the 19th century, in active reforestation and protection from snow damage, especially that caused by snowslides and avalanches. The latter is described in detail and cost figures are cited for planting and protection work.—*G. Kempff.*

4278. Pringle, James M. **Planting pines by prison labour at Tuncurry, N. S. W.** Australian Forest Jour. 7: 180–183. 1924.—Methods and results in planting *Pinus insignis* and *P. pinaster* are discussed.—*C. F. Korstian.*

4279. Rafn, J. **Skovfrøanalyser in Saesonen 1922–23. [Forest seed analysis in the year 1922–1923.]** Dansk Skovfor. Tidsskr. 9: 67–86. 1924.—The seed of a new race of larch from

the Vosges has very good "utilization value" (germination capacity of clean seed) for this species, 3 tests running 48.5, 49.5, and 71.4%. Seed of Scoth origin, on the other hand, has a value of only 4.5%. A table gives weight, purity, percentage of germination, utilization value, and germination period of seed of various European and American conifers.—*W. H. Meyer.*

4280. Ritter, G. J., and L. C. Fleck. **Chemistry of wood: VI. The results of analysis of heartwood and sapwood of some American woods.** Indust. and Eng. Chem. **15**: 1055–1056. 1923.—The work was undertaken to determine whether there is any uniform difference in chemical composition between sapwood and heartwood in either softwoods or hardwoods. It was found that in softwoods the water, ether, and alkali extracts are higher, and the cellulose and lignin correspondingly lower in the heartwood (except lignin in white cedar). The hardwoods are divided into 2 groups: (a) those with high extractives in the heartwood, and (b) those with high extractives in the sapwood. The former have high cellulose content in the sapwood; the latter in the heartwood. The percentage of acetic acid resulting from hydrolysis is higher in the sapwood than in the heartwood of both soft and hardwoods.—*Henry Schmitz.*

4281. Ritter, G. J. **Chemistry of wood: VII. Relation between methoxyl and lignin in wood.** Indust. and Eng. Chem. **15**: 1264–1266. 1923.—The lignins from hard and soft woods differ in chemical composition. A larger percentage of the total methoxyl is recovered in softwood lignin than in hardwood lignin. Approximately 62% of the methoxyl in white oak and yellow pine sawdust was recovered as methanol by treating the wood with dilute alkali under pressure. The methanol obtained by this treatment is equivalent in amount to the methoxyl found in the crude volatile products of destructive distillation of wood. It is indicated that the actual period of chlorination can be reduced approximately ½ in isolating cellulose.—*Henry Schmitz.*

4282. Ritter, G. J., and L. C. Fleck. **Determination of cellulose in wood. Chlorination method.** Indust. and Eng. Chem. **16**: 147–148. 1924.—In preparing pulp for paper commercially, 40–45% of the wood is utilized. Approximately 60% should be utilized, for that amount of cellulose can be isolated from the wood by the chlorination method.—*Henry Schmitz.*

4283. Roeser, Jacob. **A study of Douglas fir reproduction under various cutting methods.** Jour. Agric. Res. **28**: 1233–1242. *Pl. 1.* 1924.—This study involves 4 plots, located at 9,100 feet at the Fremont Exp. Sta. in Colorado. One plot was clear cut; another was cut under a selection system; a 3rd was cut according to the shelterwood method, and the 4th was left in its original state. Since 1919 the amount of reproduction has tripled on the selection and shelterwood areas, and has increased slightly on the clear-cut plot, while the original forest shows no increase. On the cut-over plots there is a perceptible yearly increase of 3-year-old or established seedlings, while this class is decreasing under the virgin forest. The amount of soil moisture, particularly the drought caused by the drain of the older trees upon the surface layers, is more potent than light in controlling reproduction. The method of slash disposal plays only a minor part in germination and survival. The ratio of root length to humus depth was found to be a deciding factor in survival during the 1st 3 years. Fir seedlings in the shelter of brush, grass, or litter can grow where the humus is as much as 1¾ inches deep, while for unprotected seedlings the maximum is about 1¼ inches. For spruce seedlings the figures are approximately 1.4 and 1.1 inches. The average depth of humus is about 1 inch on the partially cut plots, 1.55 inches on the clear-cut plot, and 1.18 inches in the virgin forest. Protected seedlings were larger than those without protection, the average difference being 0.27 inches for fir. The young trees have developed best under the shelterwood cutting, which seems to be the system best adapted to Douglas fir stands in the Central Rocky Mountains. With clear-cutting, 1 acre is too large an area to be reseeded from the sides. Figures show the height growth of Douglas fir, Engelmann spruce and limber pine seedlings between 4 and 10 years under various methods of cutting and in the original forest.—*Author.*

4284. Roth, Gy. **Tanulmányut Sopron város erdejében. [Studies in the forest of Sopron.]** Erdészeti Lapok [Budapest] **63**: 153–163. 1924.

4285. Rubner, Konrad. **Die pflanzengeographischen Grundlagen des Waldbaus. [The**

phytogeographic basis of silviculture.] *273 p. 2 maps.* J. Neumann: Neudamm, 1924.—As the future development of silviculture will be in the direction of greater refinement and more individualized treatment, adapted to local conditions, understanding of the relations between trees and various environmental factors is fundamentally important. Part I treats of the effects upon tree growth of various factors of climate and situation, with a chapter on edaphic factors by W. Graf zu Leiningen-Westerburg. Part II takes up the individual species, sub-species, and races and their natural distribution in Europe. Part III deals with the synecology of the species in forests, discussing briefly the competition and succession of species, the structure of the virgin forest, and the subordinate or soil flora, including mosses. The theory of indicator species for determining quality of site is discussed.—*W. N. Sparhawk.*

4286. Saetersmoen, Per. **Maling av stammetverrsnitt. [Measurement of the cross-section of the stem.]** Tidssk. Skogbruk 32: 320–330. 1924.—The divisions of the calipers are based on basal areas instead of diameters so as to maintain a uniform degree of accuracy. With the usual cm. divisions, the error in measuring the basal area of a tree would tend to increase with the size of the tree.—*W. H. Meyer.*

4287. Saxlund, M., H. Lie, og G. Holmsen. **Norges vernskog. I. [Protection forests of Norway. I.]** Tidsskr. Skogbruk 32: 279–319. 1924.—Saxlund's introduction outlines the problems of the protection forests. Lie, under the topic "Mountain Forests," describes the limiting factors of such forests, the classes of mountain forests in Norway, the recession of the upper limits due to unwise cutting, the favorable effect of these forests upon the region below, and the management of the various classes. Careful selection cutting is to be used in the lower mountain forest, cutting only for household use in the upper coniferous belt and cutting at rest periods in the birch forests. Success of reproduction always must be considered. Holmsen, in a chapter on "The Westcoast Forest in Prehistoric Times," compares the present and the past extent of the forest, and briefly describes the soils.—*W. H. Meyer.*

4288. Saxlund, M., O. H. Holta, O. S. Bakke, og J. Urbye. **Norges vernskog. II. [Protection forests of Norway. II.]** Tidsskr. Skogbruk 32: 391–401. 1924.—Saxlund describes forest conditions on the Hvaler island group. The others report on certain other districts.—*W. H. Meyer.*

4289. Scherg, K. **A gyertyánról. [Concerning Carpinus.]** Erdészeti Lapok [Budapest] 63: 22–24. 1924.—*Carpinus betulus* yields good firewood, excellent timber for industrial use, protects the soil, and reproduces well. Its growth should be encouraged in the forests of Hungary, which lie mostly in the castanetum, and partly in the fagetum.—*Istvan Györffy.*

4290. Schmidt, Werner. **Samenkundliches von der Königsberger Ostmesse. [Notes on seed science from the Königsberg exhibition.]** Deutsch. Forstzeitg. 40: 50–52. 1925.—Suggestions are made regarding testing and storage of tree seed.—*W. N. Sparhawk.*

4291. Sherrard, E. C., and W. H. Gauger. **Effects of acids and salts upon the hydrolysis of wood.** Indust. and Eng. Chem. 15: 1164–1165. 1923.—The effect of several salts on the acid hydrolysis of wood is described, as well as the effect of several acids, when used alone and in conjunction with mineral acids. A study was made of the quantity of sugar produced from white spruce by varying the concentration of sulphuric acid from 5 to 30%. The effect of time and pressure upon sugar yields is also described. The rate of decomposition of mannose is practically the same as that of glucose under similar conditions.—*Henry Schmitz.*

4292. Skinnemoen, K. A. **Differensmetoden. [The "difference" method.]** Tidsskr. Skogbruk 32: 423–443. 1924.—The "difference method" of volume increment determination and the errors involved in its use are discussed. Annual volume increment equals the difference in volume between 2 size classes divided by the number of annual rings found in a boring the length of which is equal to the difference in radii. In plotting curves from these measurements, errors are caused by the tendency of heights to be relatively low for the larger diameters. On the better sites, this error is considerable. The tendency of trees in open stands to be shorter and hence of different form also leads to errors in computing the volumes at the beginning of the period. Allowance must also be made for variation in the thickness of bark between small and large diameter classes.—*W. H. Meyer.*

4293. Spitzenberg. **Schutzmittelbehälter mit Tunkpfanne und seitlicher Gegenbürste für den Pflanzenschutz.** [A container for liquids used for plant protection.] Deutsch. Forstzeitg. 40: 23–26. *1 fig.* 1925.—In German forests it is a practice to smear the foliage of young seedlings with tar or other unpalatable liquids in order to prevent browsing by various animals. The author describes an improved form of container, and the method of applying the liquid.—*W. N. Sparhawk.*

4294. Teixeira da Fonseca, Eurico. **Indicador de madeiras e plantas uteis do Brasil.** [The timbers and economic plants of Brazil.] *v + 343 p.* Villas-Boas & C.: Rio de Janeiro, 1922.—Approximately 1100 species of trees and other plants are listed and briefly described, with notes on their distribution. For trees, information is given, where available, as to appearance, texture, weight, strength, and uses of the wood.—*W. N. Sparhawk.*

4295. U. S. A. Dept. of Commerce, Bureau of Foreign and Domestic Commerce. **Tanning materials survey. Part I. The problem of our commercial independence in tanning materials.** Trade Information Bull. 167. *1–18.* 1924.—Section 1 treats briefly the vegetable tanning materials derived from foreign sources, including quebracho, wattle and mangrove barks, sumac, divi-divi, valonia, and myrobalans. Experiments in growing sumac and wattles in the U. S. A. are recommended. Section 2 deals with domestic tannins, from hemlock, oak, and chestnut, and gives statistics of consumption of all the principal kinds of tanning material in the U. S. A. Protection of the forests against fires and tree diseases, particularly the chestnut blight, is urged.—*W. N. Sparhawk.*

4296. Vetter, G. **Zur Aufforstung im Eulenfrassgebiet.** [Reforestation in the districts devastated by the owl-moth.] Deutsch. Forstzeitg. 40: 83–84. 1925.—Sufficient pine seed lies dormant in the duff to restock the devastated stands, provided the soil is worked so as to mix the humus and mineral soil, thus creating conditions favorable to germination and survival of the seedlings.—*W. N. Sparhawk.*

4297. Volkert, Robert M., and Bryant D. Dain. **Utilisation of forest products—its place in forestry.** Australian Forest. Jour. 7: 219–224. 1924.—The waste problem and the possible effects of closer utilization are considered and a strong plea is made for greater emphasis on this phase of forestry in the forest schools.—*C. F. Korstian.*

4298. Watier, C. H. **Note sur l'évolution des euphorbes cactoides dans le Sud-Marocain.** [Evolution of the cactaceous euphorbias in southern Morocco.] Rev. Eaux et Forêts 59: 314–318. *Pl. 1–2.* 1921.—The cactaceous Euphorbias seem to grow by preference on rocky slopes exposed to the sun where they are without competition from other plants. In southern Morocco, where the plant associations are particularly open, it is difficult to prove that there is any competition between the species that is likely to result in the elimination of one or the other; and it seems probable that the Euphorbias and associated species will evolve independently. The Euphorbias participate less than other species, if at all, in the general regression of vegetation in southern Morocco, and were formerly able to replace species which have now disappeared and perhaps even some that are still present in the region. It is difficult to present any reasonable hypothesis for the origin and present distribution of *E. resinifera.* More information regarding its distribution both in Morocco and in the rest of Africa is needed.—*S. T. Dana.*

4299. Wiedemann, Eilhard. **Fichtenwachstum und Humuszustand. Weitere Untersuchungen über die Wuchsstockungen in Sachsen.** [Spruce growth and humus condition. Further investigation of growth stagnation in Saxony.] Arbeit. Biol. Reichsanstalt Land- u. Forstw. 13: 1–77. 1924.—In the spruce forests of Germany there arises at certain growth periods an abnormal condition in the humus, usually characterized by the formation of dry turf, the result of which is growth stagnation. This condition arises upon a diversity of soils and under varied climatic situations. One factor responsible for dry turf formation is the preponderance of needles which yield slowly to decomposition. Another factor is a series of dry years during which period the humus is said to become "carbonized." In each humus the usual biologic activities of soil are at a very low ebb, and the breaking down of organic matter and the unlocking of readily assimilable nitrogenous compounds necessary for active tree growth come practically to a standstill. The cessation of growth is due primarily to shortage of plant food and not directly to sickening of the forest stand or of the

mineral soil. Lack of water is a contributing rather than a direct cause. Dry-turf formation sets in strongly at the sapling stage and may appear in less degree in older stands.—It is concluded that health in the modern forests is to be attained by creating a balance between accumulation and consumption of humus, so as on one hand, to prevent the development of a harmful dry turf, and on the other to assure a steady supply of decomposed humus for forest growth. Ways to attain this end are: (1) Systematic pruning, which affords a soil covering that will pave the way for typical nitrification plants. Preliminary experiments indicate that it is best to sell only valuable timber, reserving the rest to mix with the pure needle mass to aid in activating the humus. (2) The intermixing of plants whose offal is more favorable to bacterial activity. The lime-laden leaves of the beech offer an example. (3) The intimate mixing of humus and mineral soil by mechanical means. (4) Burning over the soil.—*W. S. Beach.*

GENETICS

Orland E. White, *Editor*

(See also in this issue Entries 4004, 4008, 4024, 4158, 4162, 4378, 4385, 4393, 4397, 4582, 4583, 4584, 4702, 4752)

4300. Almey, J. R. **Producing new varieties of flowers.** West. Gard. and Beekeeper 5: 297–301. 1924.—Flower breeding such as can be practised by the gardener is treated in simple language. As they affect breeding methods, horticultural plants are classed as follows: Closed flowers, self-fertilized, usually crossed, necessarily crossed as monoecious and dioecious forms, and those which have self-sterile flowers. Examples are given of each class. A general discussion of technique gives the information required to hybridize within the different classes.—*W. A. Carver.*

4301. Amar, Julian. **Transformism et hérédité. [Transformism and heredity.]** Compt. Rend. Acad. Sci. Paris 177: 980–982. 1923.—This is an argumentative discourse explaining and supporting Lamarckianism. The author contends that modifying agents acting mildly and continuously on organisms effect transformations in them through modifications of physiological conditions, and that these changes are inherited, if both parents have become affected by them.—*R. E. Clausen.*

4302. Anderson, E. G. **Pericarp studies in maize. II. The allelomorphism of a series of factors for pericarp color.** Genetics 9: 442–453. 1924.—A large series of pericarp color types in maize is shown to be allelomorphic or closely linked, with the evidence favoring the hypothesis of allelomorphism. An undetermined but large number of genes are involved which cannot be arranged in any simple graded series.—*J. H. Kempton.*

4303. Andersson, Irma. **Structural mosaics and inheritance of variegation in Barbarea vulgaris.** Jour. Genetics 14: 185–195. 1924.—This is a report on the study of the inheritance of variegation in *Barbarea vulgaris*, the variegation consisting of the presence of yellowish-white areas in the leaves and sometimes in the stems. Variegateds in certain families breed true and in others give green plants which subsequently behave either as true variegateds or when selfed give greens only and when crossed with true-breeding variegateds give variegateds and greens. In sectorial chimeras, in some cases, the 2 parts breed true, respectively, for greenness and variegation; in other cases, they do not breed true, the inheritance being obscure. "In general, the variegation is recessive in heterozygous combination with green. Gametic segregation in these respects occurs. Families are thus produced in general conformity with Mendelian principles. Nevertheless departures from this simpler plan are not infrequent, which must be attributed to segregation occurring in somatic tissues." Sectorial chimeras for other characters than variegation were also observed during the investigations.—*M. Demerec.*

4304. Babcock, Ernest Brown, and Harvey Monroe Hall. **Hemizonia congesta: a genetic, ecologic, and taxonomic study of the hay-field tarweeds.** Univ. California Publ. Bot. 13: 15–87. *Pl. 1–7.* 1924.—An attempt is made to synthesize from studies in genetics, ecology, comparative morphology, and geographic distribution, evidence relating to a small but complex group of the Compositae. Some of the numerous natural forms have been classed previously as distinct species; but the final result of the investigation has been a

treatment of the entire assemblage as 1 species, comprising 6 subspecies. No differences were found in number and individuality of chromosomes in the 3 subspecies examined from that aspect. The most primitive subspecies is *Hemizonia congesta lutescens*, from which 2 principal branches have been developed, one through *typica*, the other through *luzulaefolia*. Artificial hybrids are easily produced, and in some cases they duplicate supposed natural hybrids. Hybridization does not usually lead to permanent forms, but the subspecies *calyculata* is thought to have originated thus. Individual plants are self-sterile; hence the highest possible degree of heterozygosity exists in nature and many wild plants carry recessive defects. Inbreeding, in general, caused reduction of vigor. Inbreeding of certain forms of *lutescens* resulted in the production of plants characteristic of *luzulaefolia*, thus indicating that *lutescens* is more primitive. Dominance of *typica* and *luzulaefolia* in crosses with *lutescens* is further evidence that the latter is more primitive. Certain morphological and physiological characters are shown to be inherited according to Mendelian principles. These and many other variations seem to have originated through mutation. Gradual modification by the environment is not believed to result in distinct genetic types in this group. The germinal variations leading to evolution in this species are, in part at least, changes in individual genes. Natural selection of favorable mutations accounts for the origin of 5 of the subspecies, while geographic distribution of 3 of these forms indicates that isolation has been a factor in establishing them.—*Authors.*

4305. Benedict, R. C. **Variations in the dagger fern.** Amer. Fern Jour. 13: 124–126. 1924.—The paper records a summary of leaf variations noted among several hundred plants of the common Christmas fern, *Polystichum acrostichoides*, growing in southwestern Pennsylvania near Meyersdale. Variants from the normal form were noted as (A) ruffled types (B) incised types (C) crested types, that is, forms with some tendency to fork at the ends of the pinnae. No twice pinnate type was found. The variant forms did not exceed 5% of the total.—*Author.*

4306. Blakeslee, Albert F. **Distinction between primary and secondary chromosomal mutants in Datura.** Proc. Nation. Acad. Sci. [U. S. A.] 10: 109–116. 1924.—*Datura Stramonium* has normally 12 pairs of chromosomes, and consequently 12 different (2n+1) chromosomal mutants are to be expected. Twenty different mutants, however, were found. It is assumed that certain of these fall into the same group, thus making up the 12 different groups. This assumption is supported by similarities in external appearance between certain of the mutants; similarities in internal anatomy as found by E. W. Sinnott; pollen dimorphism found in 2 mutants classed as belonging to the same groups; trisomic ratios observed for the same character in 2 mutants; breeding behavior; and cytological studies carried out by John Belling.—The differences between Primaries and Secondaries, for example, between 2 types of mutations falling into the same group, are as follows: Primaries occur in high proportions in offspring from triploids; they appear more frequently spontaneously. Secondaries have a higher average proportion of bad pollen; they occasionally come from Primaries, but come regularly from Secondaries; in configuration of their chromosomes they are as found by Belling. The basis for these differences between Primaries and Secondaries is considered not to be due to a Mendelian factor but to some chromosomal modification, which in one case is assumed to result from a deficiency of a portion of the extra chromosome.—*M. Demerec.*

4307. Blakeslee, Albert F., and John Belling. **Chromosomal chimeras in the Jimson weed.** Science 60: 19–20. 1924.—During the studies with *Datura Stramonium* several chromosomal chimeras were found; 3 of them had a 2n−1 branch, 1 a 2n+1 branch and several were found with tetraploid branches.—*M. Demerec.*

4308. Brink, R. A., and J. H. MacGillvray. **Segregation for the waxy character in maize pollen and differential development of the male gametophyte.** Amer. Jour. Bot. 11: 465–469. 1924.—Plants segregating for the waxy character are found to produce 2 sorts of pollen, one giving the typical violet reaction with iodine the other staining red. The proportions of these 2 types of pollen are approximately equal, with a slight excess of the waxy sort. The possibility is pointed out that this slight chemical difference in the storage products of the pollen grains may account for the observed deficiency in waxy seed on heterozygous ears through a differential growth rate of pollen tubes.—*J. H. Kempton.*

4309. Buller, A. H. R. **Experiments on sex in mushrooms and toadstools.** Nature 114: 826. 1924.—Miss Mounce finds *Coprinus sterquilinus*, *C. stercorarius*, and *C. narcoticus* to be homothallic. Hanna finds that *C. lagopus*, like *Schizophyllum commune* and *Aleurodiscus polygonius* studied by Kniep, bears spores which, with respect to the ability of the mycelia developed therefrom to conjugate with one another, are genetically of 4 different kinds. Using a similar criterion, Miss Newton finds that *Coprinus Rostrupianus*, like *C. radians* studied by Vandendries, bears spores of 2 kinds only.—If a cover glass is gently pressed against the hymenium of a hymenomycete, then removed, many of the spores adhere in tetrads, this arrangement resulting from their production in fours on the respective basidia. The spores of a tetrad may then be sown individually, and the sexual reactions of the resultant mycelia tested.—Using this method, Hanna finds that some basidia of *Coprinus lagopus* bear spores of 2 kinds only, whereas other basidia each bear 4 kinds of spores. Buller concludes that the latter result shows that chromosome reduction occurs in the course of the 2nd nuclear division in the basidium. By the same method, Miss Newton finds that all the basidia of *Coprinus Rostrupianus* are alike in that each bears 2 kinds of spores.—*C. E. Allen.*

4310. Castle, W. E. **Genetics of the Japanese rabbit.** Jour. Genetics 14: 225–229. 1924.—The brindled or mottled coat color of the Japanese rabbit is a simple Mendelian unit character, an allelomorph of yellow and of black respectively, dominant over the former, recessive to the latter. Since there are 2 kinds of black in rabbits, Japanese (e^j) is really a 4th allelomorph of the extension factor. In order of dominance these are dominant black (E^d), black (E), Japanese (e^j), and yellow (e).—*H. C. McPhee.*

4311. Chidester, F. E. **The origin of cyclopean monsters.** Amer. Nat. 57: 496–518. 1923.—In cyclopia are all gradations from a single median eye to an hour glass eye, or to 2 eyes close together. The optic nerve shows varying degrees of abnormality. Cyclopia is known to occur in mammals, birds and fish. Mammalian cyclops do not live long on account of inability to breathe. Cyclopia frequently occurs with hydrocephaly, the skull being greatly distorted. If unaccompanied by hydrocephaly, the frontal bones are fused; the ethmoid, nasal, superior maxillary, lachrymal, vomer, and inferior turbinated are absent. In cyclopia the 1st cerebral vesicle is the one most affected, the corpora quadrigemina, pons, medulla, cerebellum, 4th ventricle and crainial nerves back of the 4th are usually normal. The circle of Willis may or may not be normal. Deformities of parts of the body other than the head are frequent in cyclopia. Some show spina bifida, polydactyly, inversion of the viscera and abdominal hernia. Cyclopia has been produced mechanically, by hybridization in fish, by temperature change in birds and fish; and chemically in the flat worm, fish, chick, and mammals. Cyclopia in mammals, as in lower forms, is due to the action of some physical or chemical agent at the period just before the optic vesicles are pushed out. The eyes seem extremely susceptible to the external influences. The theory is advanced that disturbance of the metabolism of the mother due to disordered secretion of the hormones may be a contributing cause of the numerous mammalian deformities.—*Isabel Potter.*

4312. Cockerell, T. D. A. **A yellow variation of Eustoma (Gentianaceae).** Torreya 24: 50–51. 1924.—A new form of *Eustoma russillianum* (Hook) Griseb. with clear yellow flowers (f. *flaviflorum* n. f.) was found by Mrs. S. B. Walker in 1914, near Denver, Colorado, along with the ordinary blue form. The yellow is evidently due to a soluble flavone. It is of unusual interest, because the type of *Gentiana* (*Gentiana lutea L.*) has yellow flowers, as have also the Asiatic *G. Othophora* French and certain species of *Centaureum.*—*W. A. Carver.*

4313. Connors, C. H. **The control of color in Hydrangea.** Florists' Exchange 57: 1563–1564. 1924.—Hydrangeas are blue in acid soil and pink in soils that are slightly acid to alkaline, but with an excess of alkalinity the plants become chlorotic. Directions are given for the use of ground limestone in producing pink flowers. The treatment should begin during the summer while the plants are in the field and be continued in the greenhouse forcing.—*A. B. Stout.*

4314. Cowdry, E. V. (Editor). **General cytology.** *vii + 754 p. 9 pl., 173 fig.* Univ. Chicago Press: Chicago, 1924.

4315. Craft, W. A., and H. W. Orr. **Thyroid influence in cattle.** Jour. Heredity 15: 255–256. *Fig. 11.* 1924.—Observations were made by the writers on a steer calf that ex-

hibited characteristics similar to the characteristics common to cretinism in man. The observations were extended over a period of 100 days. Although the calf was not subjected to experimental treatment, close observations were made. It had the best of feed and care and made no noticeable change during this time.—The calf was slaughtered and an examination of the thyroid, parathyroids and pituitary body revealed a general lack of development. The thyroid was only about $\frac{1}{5}$ normal size, the parathyroids were correspondingly small and the pituitary body proved to be about $\frac{1}{2}$ normal size. The ends of all the long bones were enlarged, and the bones were irregularly curved. It is believed that the condition of the glands was the cause of a general dwarf-like cretinous condition of the calf. The calf was short in body, short in head, bulged slightly in forehead and was short in under jaw and face. It has short and curved legs, and a nervous disposition.—*W. A. Craft.*

4316. Cunningham, J. T. **Sex-limited characters in birds and their bearing on Lamarckian theory, with new suggestions concerning the genetics and origin of hen-feathering.** Sci. Prog. **19**: 431–442. 1924.—The author reviews the theories accounting for the origin of the secondary sexual characters in animals. He favors a Lamarckian explanation for their origin, claiming that the parts of the body having these characters are regularly subjected to special stimulations in the sex behavior of the animals, that this stimulation produces hypertrophy in the affected tissues, and that waste substances in these tissues act in the gametes upon special parts of chromosomes corresponding to the organs stimulated, thus inducing a similar enlargement of these organs in the posterity. This explanation seems to account most satisfactorily for the situation in fowls, in which the male sex characters have become independent of the testicular hormone, but are suppressed by the presence of a foreign hormone, namely, that of the ovary. The occurrence of cocks with the plumage of hens but with the comb, wattles and sex instincts of ordinary males, and the fact that in some birds, as the grebes, the attitudes of the 2 sexes in pairing is similar, are taken as giving added evidence for the author's viewpoint. He criticizes T. H. Morgan's view that the secondary sex characters are the by-products of genes which give rise to gonadal hormones, on the basis that experimentation shows that the gonadal hormones are very similar in different animals, whereas the secondary characters are quite different.—*L. A. Kenoyer.*

4317. Danser, B. H. **Über einige Aussaatversuche mit Rumexbastarden. [Results of plantings of Rumex hybrids.]** Genetica **6**: 145–220. *4 fig.* 1924.—The sterility of Rumex hybrids has long been maintained by floriculturists. The subgenus *Lapathum* of the genus *Rumex* is divided into hundrds of species between many of which hybrids occur. Hybrids are characterized by sterility or greatly reduced fertility and secondary growth changes; they occur only in the region of parent forms. Frequently characters occur which are not found in either parent, but which are due to a combination of parental characters. Crossing between species of Lapathum is the rule rather than exception. The author secured the following spontaneous hybrids (confirming past data): *R. domesticus* × *R. crispus*, *R. domesticus* × *R. obtusifolius*, *R. crispus* × *R. obtusifolius*, *R. stenophyllus* × *R. crispus*, *R. conglomeratus* × *R. obtusifolius*, *R. pulcher* × *R. obtusifolius*, *R. dentatus* × *R. maritimus*, *R. obovatus* × *R. maritimus* and *R. obovatus* × *R. dentatus*. The hybrid, *R. Thellungii* (*R. dentatus* × *obovatus*) he secured from both parents. The others were all secured from the first named parent. He obtained the following new results: *Rumex plathyphyllus* (*R. aquaticus* × *R. obtusifolius*), produced 1 plant resembling the ♀ parent but more sterile; *Rumex Mezei* (*R. alpinus* × *R. obtusifolius* produced 4 plants, practically identical whose interpretation would have been impossible without knowing the ♀ parent; *R. maximus* produced heterogenous progeny in directions of both parents, *Rumex limosus* (*R. conglomeratus* × *R. maritimus*) produced heterogeneous progeny, weak and sterile; *Rumex acutus* had the most heterogeneous progeny; *Rumex Thellungii*, partly selfed and perhaps partly back-crossed to *R. obovatus* gave a great variety of progeny. Discussion concerned with the concept of pairing-relationship or, "syngameon" as related to Lotsy's use of this term. The suggestion is made that species designation be limited to forms readily mated.—*J. Ben Hill.*

4318. Demerec, M. **A case of pollen dimorphism in maize.** Amer. Jour. Bot. **11**: 461–464. *1 fig.* 1924.—Pollen grains of plants heterozygous for the waxy character, when treated with iodine show that the segregation of this character can be detected, approximately $\frac{1}{2}$ the grains staining red, the other $\frac{1}{2}$ violet.—*J. H. Kempton.*

4319. Dix, W. **Originalsaatgut und Nachbau sowie Schutz des Zuchters. [The creation of new varieties, building up seed stocks and the protection of plant breeders.]** Zeitschr. Pflanzenzucht. 9: 217–233. 1924.—The reproduction value of seed stocks produced by the original breeder of a strain and by other growers who increase the strain in later years, the principles underlying breeding and seed-production, factors determining the value of seed, and methods of identifying seed stocks are considered. The reproduction-value of the seed stock depends on its ability to produce a good stand of healthy plants and to make use of the fertility of the soil. These things depend on both heredity and environment. Definitions of terms used in connection with seed-control work are given. Methods of certification and of protecting the breeder as to his profits are discussed, including legislation involving trade names, licenses, etc., and arrangements whereby the increase of seed is kept somewhat under the control of the breeder and by means of which the grower for a time shares in the profits of increase-growers.—*C. E. Leighty.*

4320. Fronda, F. M. **Cantonese—A new breed of poultry.** Jour. Heredity 15: 371–376. *Fig. 2–6.* 1924.—The origin of the "Cantonese" fowl, "Wong Kai," or Yellow Fowl as it is known in Canton, China, its native place, is discussed, and the breed described. Selection work being done in the College of Agriculture, University of the Philippines, has produced a more uniform type and color, but further improvement is still expected. So far, the results strongly indicate that the Cantonese can be made a factor of some importance in the poultry industry of that part of the world. The standard that is being followed in all selection work at the College is also given.—*Author.*

4321. Goldschmidt, R. **The mechanism and physiology of sex determination.** Translated by W. J. Dakin. *viii + 259 p. 6 pl., 107 fig.* Methuen & Co., Ltd.: London, 1923.—The book covers thoroughly the field indicated by the title. Aside from a short introduction devoted to a discussion of the nature of sex, the book is divided into 2 sections, one of which deals with the basic facts, the other with special problems and additional facts. The section on basic facts is further subdivided into 2 parts, one dealing with the mechanism of normal sex heredity, which summarizes the evidence derived from experiments, cytology, etc., on this problem; the other containing a treatment of the physiology of sex inheritance, which is devoted mainly to an account of intersexuality and its significance. The section on special problems and additional facts contains chapters on the inheritance of secondary sexual characters, hermaphroditism, and parthenogenesis and sex, numerical ratio of the sexes, and sex determination in man.—*R. E. Clausen.*

4322. Goldschmidt, R. **Untersuchungen über Intersexualität. III. [Investigations on intersexuality. III.]** Zeitschr. Indukt. Abstamm.- u. Vererb. 31: 100–133. *10 fig.* 1923.—This paper deals with the quantitative relationships of the factors, *F* in the Y-chromosome, for ♀ tendency, and *M* in the X-chromosome, for ♂ tendency. Crosses of "strong" females by "weak" males, giving both sexes normal, were carried to F_2 and backcrossed. Peculiar ratios were due to the transformation of males, *MM*, to females by the strong *F* enzyme in the cytoplasm, resulting from action of Y-chromosome before maturation. F_1 females from "strong" by "weak" crossed to intermediate races give females and a few highly intersexual males, the minus individuals of the transformed group. Autosomal factors are postulated to explain grades of ♂ intersexuality. From "weak" female by "strong" male only males are obtained, ½ of which should be *Mm*. To test this, 4 lines of experiment are set forth: (1) Backcrosses of these males to "weak" females should show true males, giving 3 males to 1 female; and transformed males, giving 2 males to 1 female (*mm* is non-viable). The results show distinct bimodality of sex ratios, as expected. (2) Backcrosses of the same F_1 males to "strong" females should give ratios of 1 ♀ to 1 ♂ from true males and of 2 females to 1 male from transformed males. Again the expected bimodality is shown. (3) Crosses of F_1 females from "strong" female × Hokkaido male to F_1 males from Hokkaido female × "strong" male show 2 types of males as expected,—true males giving 3 females to 1 male, and transformed males giving 2 females to 1 male. (4) Most zygotic males from "strong" × Hokkaido crossed with German are turned to females, but a few are strongly intersexual. From this it follows that the 2 types of males, true and transformed, from Hokkaido × "strong" may be tested by crossing to females from "strong" × German. True males then produce 3 females + inter-

sexual males to 1 male; while transformed males produce 2 females to 1 male with no intersexes appearing. This is then a qualitative as well as a quantitative test. The results agree with expectation except for the modification of the ratio due to poor viability of intersexual males. Transformation of ovary into testis in transformed males is shown to occur at a very early larval stage. Further proof is given of maternal inheritance of *F*. In complicated crosses such as (((A × B) × (C × D)) × B) × (R × S), the final results always show the effect of *F* from ♀ A combined with *MM* from the last used ♂. Graphic presentation is made of the physiology of development. The earlier the turning point in the ontogeny of intersexes the greater the intersexuality, the time depending upon the relative quantity of *F* and *M* hormones. New curves for ♂ intersexuality are shown. There is a gap in the series of transformation of males, the very highly intersexual not appearing. This is probably due to developmental difficulties, for transformed males come through.—*P. W. Whiting.*

4323. Gruber, K. **Vererbungserscheinungen bei Cladocerenrassen. [Genetic phenomena in Cladocera races.]** Zeitschr. Indukt. Abstamm- u. Vererb. 33: 301–305. 1924.—In *Scapholeberis mucronata,* frontal spine gradually decreases from brood to brood and from generation to generation through the season, while the mucron gradually increases until early autumn, when it is greatly diminished. This temporal variation is hereditarily fixed. The tendency to vary increases in individual from molt to molt. Young fresh from the brood chamber exhibit almost no variation, and resemble the stem mother. Changes during the life of the individual are like those occurring during the season. That these changes are due to the long-continued effect of environmental factors upon the local race is shown by their fixed heredity. The larger the body of water in which the animals live, the longer the spines become. The original type from which all races came must have had a long frontal spine and a well-formed mucron, since young stages are of this form. The original must also have been a sea form. In nature, the species is monocyclic as to sexuality. In starved cultures the sexual forms appeared in May and June but ceased to be produced where abundant food was supplied. This early sexual period is regarded as a return to the earlier condition in the species. Length of time is regarded as important in producing varietal differences by means of environment. The probable explanation of the changes lies in the inheritance of acquired characters, but an enormous number of generations is required, hence experiments cannot verify this conclusion.—*A. Franklin Shull.*

4324. Gutmann, M. J. **Zur Paralysefrage bei den Juden. [The problem of paresis among Jews.]** Arch. Rass.- u. Gesellschaftsbiol. 16: 67–84. 1924.—Jews in central Europe have been found to have a 50% greater incidence of paresis (general paralysis of the insane) than Gentiles. Females are rarely affected. Gutmann, working over 65 new cases, finds the dementing type commonest of all types among Jews, but not nearly so superabundantly so as among Gentiles. All the other types, though not so common as the dementing, are each relatively 2–3 times as common as among Gentiles. The expansive megalomanic type and the depressed type are characteristic of Jews. There is no paresis except after infection with syphilis, but not always then. About 28% of Jewish paretics show mental and nervous defects in their immediate ancestry—a much higher rate than in Gentile paretics or in the population at large. The symptoms of paresis appear when the infection falls on a special hereditary substratum.—*C. B. Davenport.*

4325. Haecker, V. **Einige Aufgaben der Phanogenetik. [Some problems of phenogenetics.]** Studia Mendeliana. *P. 78–91.* Typos: Brünn, Czechoslovakia, 1923.—The ideal solution of genetical problems would be the determination of those points in the ontogeny where a divergency in the germ cells takes place. They may perhaps be recognized by different structural or chemical composition. Defect mutations and lethal factors should be studied upon a physiological basis. The action of certain stimuli upon germ and soma should be linked with investigations on acquired characters. Many other characters, linked or correlated, and also abnormalities in man and in animals should be followed back to their origin in ontogeny.—*L. A. Waitzinger.*

4326. Harper, R. A. **Inheritance of sugar and starch characters in corn.** Bull. Torrey Bot. Club 47: 137–186. *Pl. 3–5.* 1920.—In crosses between sweet and non-sweet types of maize, occasionally some seed appear which are intermediate between sweet and starchy.

While these intermediates do not breed true for this condition, it predominates in their progeny. The author agrees that there is ample evidence of chromosome reduction in sweet-starchy hybrids but not of the so-called purity of the gametes. The current practice of assuming modifying factors, inhibitors, etc., is believed to be unwarranted since there is no adequate evidence that any such assumed factors are distributed in reduction divisions in any clear-cut fashion. It is held that to name in the germ plasm the same qualities observed in the source explains nothing and is merely the old preformation in a modern guise. The author concludes that the current interpretation of the behavior of the sugar and starch characters in corn as due to a pair of fixed Mendelizing factors, subject to only rare and relatively unimportant mutations, has not been in accordance with the facts.—*J. H. Kempton.*

4327. Hausman, Leon A. **Further studies in the relationships of the structural characters of mammalian hair.** Amer. Nat. 58: 544–557. *1 pl., 9 fig.* 1924.—From the study of 190 samples of hair from as many species of mammals it was found that the forms of the cuticular scales bear relation not to the groups to which the species have been assigned but to the diameter of the hairs which they bear. Upon its body, a single individual may have hairs of different and widely separated structural groups. Medullar form, like scale form, is related not to the natural group but to the hair shaft diameter. Fine hairs may possess relatively very large scales or relatively small ones, but with coarser hairs the scales are uniformly small. It was found that there is no very marked variation in either scale or medulla form in human hair. In general, the coarser the hair the finer the scalation. Specific differences exist, commonly, to aid in identifying the species of mammal from which a given hair sample was obtained.—*H. C. McPhee.*

4328. Hayes, H. K., and H. E. Brewbaker. **Frequency of mutations for chlorophyll-deficient seedlings in maize.** Jour. Heredity 15: 497–502. *Fig. 14, 15.* 1924.—The frequency of the appearance of chlorophyll-deficiencies has been observed in 1st year self-fertilized lines of 6 varieties of maize commonly grown in Minnesota. The percentages of 1st year self-fertilized lines which segregated for chlorophyll-deficiencies varied from 39.4% in Minnesota No. 13 to 7% in Northwestern Dent. The large percentage of segregating lines in Minnesota No. 13 indicates that recent mutations for chlorophyll-deficiencies have appeared in 953 selfed lines of maize which were obtained from 7 varieties and the progeny of 1 cross.—*H. K. Hayes.*

4329. Hays, F. A., and R. Sanborn. **The inheritance of fertility and hatchability in poultry.** Massachusetts Agric. Exp. Sta. Tech. Bull. 6. *19–42.* 1924.—This report covers 11 hatching seasons and is based on 758 individual pullet hatching records and 253 individual yearling hatching records. Fifteen correlation tables are presented from which the following deductions are made: (1) No correlation was found between fertility and hatchability in 758 pullets. (2) Fertility in the hen behaves as an individual characteristic with a fair degree of constancy from year to year. (3) Fertility does not appear to be transmitted from mother to daughter. (4) Hatching power is more constant from year to year in the same hen than is fertility. (5) Hatching power gives evidence of being transmitted from mother to daughter. (6) Fertility in the male behaves as an individual characteristic and probably with some constancy in the same individual from year to year. (7) The fertility record of a hen is no index to the fertilizing ability of her sons. (8) Fertility does not appear to be transmitted from sire to daughter. (9) Hatchability is more constant from year to year in the same ♂ than is fertility. (10) Fertility does not appear to be transmitted from sire to son. (11) The hatching power of a ♂ cannot be judged by his dam's hatching record. (12) Hatching power gives evidence of being transmitted from sire to daughter. (13) Insufficient data are available on the transmission of hatching power from sire to son. (14) Fertility is evidently not an inherited characteristic. (15) Hatchability is evidently an inherited trait. High hatchability is dependent in inheritance upon 1 dominant gene. Both ♂ and ♀ parent govern the hatching record, thus obscuring the true genetic composition of either parent. (16) Hens genetically pure for high hatchability may be discovered through their own hatching record. Males genetically pure for high hatchability can be distinguished from males heterozygous for the factor only by the progeny test combined with mating tests. Both the mating and the progeny test should be used for choosing males to improve the flock in hatchability.—*F. A. Hays.*

4330. Holmes, S. J. **Size of college families.** Jour. Heredity 15: 407–415. 1924.—In a

study of the size of the families from which the ♂ students of the University of California (classes of 1922–1924) were derived, it was found that the average number of children per family was 3.66. Students whose parents were foreign born came from families averaging 4.60, while students from native born parents came from families averaging 3.34. Families of mixed parentage were intermediate in size between those of the native and those of foreign born parents. Students of Catholic parentage came from families of 4.44 children, while those from Protestant parentage came from families of 3.48 children. The size of families furnishing college students was found to vary inversely with the degree of education of the parents. When both parents were college bred the family was the smallest in size, namely, 3.10 children. When both parents had a high school education, the number of children was 3.38 and when both parents had only a common school education, the number of children was 4.17. Taking 1 parent from each of the 3 groups, common school, high school, and college, the number of children per family was found to decrease regularly with the increased education of the other parent. The education of the mother was found to be more strongly correlated with family restriction than was the education of the father. The families of the grandparents of college students averaged about 1.5 more children than the families of the parents.—*Author.*

4331. Huxley, Julian S. **Mendelism and evolution.** Nature 114: 464. 1924.—As the blond characters of the "white Indians" were evidently brought about by a single determiner, and as certain bionomic conditions tend to prevail the following series may be postulated: Mutation, resultant preferential mating, followed by the establishment of a definite intraspecific unit with a consequent accentuation of differences by any future mutations.—*L. R. Waldron.*

4332. Inman, O. L. **Four generations of symphalangism.** Jour. Heredity 15: 329–334. *Fig. 7–11.* 1924.—Symphalangism as traced through 4 generations behaves like a dominant Mendelian trait. The joint fusion is more marked on the digits of the feet than in the hand, since 4 toes on each foot show fused distal joints and but 2 fingers on each hand have the distal joints fused.—*Author.*

4333. Issayev, V. **Researches on animal chimaeras.** Jour. Genetics 14: 273–354. *Pl. 9–17, fig. 1–6.* 1924.—*Hydra oligactis* Pallas and *H. vulgaris* were grafted together using 3 types of grafts named, respectively, complantation, insertion, and dissociation. It was thought that such heteroplastic grafts would throw considerable light on the relation of 2 distinct body plasms when in intimate contact. Animal chimaeras were produced by all 3 methods of grafting and carried through several asexual generations. The proportion of tissue of the 2 original parents that were grafted varied widely in later generations. Some offspring were clearly of 1 parental tissue while others were made up of varying proportions of parental tissue. The author likens such segregation of parental tissue to the segregation of genes. These experiments provided a means of establishing new species that may be propagated asexually. No sexual generations are recorded in this work.—*F. A. Hays.*

4334. Jenkins, Merle T. **Heritable characters of maize, —Iojap striping, a heritable chlorophyll defect.** Jour. Heredity 15: 467–472. *Fig. 20–21.* 1924.—Heritable chlorophyll variations were found to be very common in a number of standard varieties of maize from the Corn Belt and in a few varieties from other sources. Out of a total of 3,750 progenies grown from ears self-pollinated for the 1st time in 1922, 680, or 18.1%, were found to be segregating for chlorophyll defects in the seedlings and 152, or 6.1%, were found to be segregating for chlorophyll defects in the mature plants.—A type of seedling chlorophyll striping called *iojap striping, Ij ij,* was studied and was found to be inherited as a simple Mendelian recessive.—*Author.*

4335. Jones, Donald Forsha. **Genetics in plant and animal improvement.** *viii + 568 p. 229 fig.* John Wiley & Sons: New York, 1925.—This book is primarily written for the beginning course in genetics. Application and theory are closely welded throughout the book through the use of numerous examples. The subject matter is grouped under the headings: Genetics and its application to agriculture; the relation of animals and plants to their surroundings; how living organisms reproduce themselves; segregation and recombination; The carriers of inheritance; sex and sex-linked characters; large and small variations; measur-

ing variation and correlation; composition of plant and animal populations; hybridization in plant and animal improvement; vigor accompanying hybridization; inbreeding; sterility; methods for plant improvement; methods for animal improvement; and glossary. Footnotes are all but eliminated and a list of over 250 references is appended.—*Orland E. White.*

4336. Jones, D. F. **The attainment of homozygosity in inbred strains of maize.** Genetics 9: 405–418. *Fig. 1–2.* 1924.—Four strains of maize, self-fertilized for 8 generations or more, were each separated into 2 paired lines, these being again self-fertilized for 8–9 generations. The paired lines of 2 of these strains at the end of this period did not differ visibly in any respect, 1 strain differed only in seed color while the 4th was noticeably different in many characters.—When the paired lines were crossed there were significant increases in some characters in which the strains were visibly alike, while significant increases were obtained in all characters in the hybrids between the paired lines which differed in many respects.—Self-fertilizing plants produced by the crossing of 2 long inbred strains, in 7 generations, again brought about a reduction in size and an increase in uniformity until about the same level of vigor was established, after which the reduction practically ceased.—*J. H. Kempton.*

4337. Jones, D. F. **The origin of flint and dent corn.** Jour. Heredity 15: 416–419. *2 fig.* 1924.—A cross of a Peruvian variety of corn (*Zea Mays*) known as Cuzco, having large seed with only soft floury endosperm, with a small-seeded pop corn having only corneous starch, produced some F_2 seed of typical dent type on the F_1 ears and some of typical flint type, indicating that the 2 main types of field corn, dent and flint, may have resulted from the crossing of 2 such extreme types.—*Author.*

4338. Jull, M. A. **The relation of antecedent egg production to the sex ratio of the domestic fowl.** Jour. Agric. Res. 28: 199–224. 1924.—Crosses were made between Barred Plymouth Rocks and White and Brown Leghorns and the experiment was carried over 3 years. Sex was determined on a total of 2,396 chicks from the 12th day of incubation or later. Egg records were secured on 45 birds during the experiment. A sensible negative correlation was found between antecedent egg production and sex ratio of -0.704 ± 0.037. The normal sex ratio was -0.165 ± 0.076, probably not significant. No correlation was found between egg weight and sex ratio, yolk weight and sex ratio, or yolk water content and sex ratio. Prenatal mortality will not explain the variation in sex ratio in relation to egg production. There was no indication of the reversibility of sex. Male-producing zygotes appear in excess during the early period of egg production and with heaver laying later on, ♀ zygotes appear in excess. The hypothesis is suggested that environmental conditions may affect the reduction process in such way as to cause the extrusion of an excess of male-producing gametes early in the laying year and the reverse condition later on.—*F. A. Hays.*

4339. Kearney, Thomas H. **Non-inheritance of terminal bud abortion in Pima cotton.** Jour. Agric. Res. 28: 1041–1042. *Pl. 1.* 1924.—A common malformation of the cotton plant results from abortion of the terminal bud of the axis. Comparison at Sacaton, Arizona, of progenies of 12 such "aborted" individuals of Pima cotton with progenies of adjacent or nearby normal individuals gave no evidence that the condition is inherited, the "normal" progenies having contained a slightly (although not significantly) higher percentage of aborted plants than the "aborted" progenies.—*Author.*

4340. Kempton, J. H. **Correlation among quantitative characters in maize.** Jour. Agric. Res. 28: 1095–1102. *1 pl.* 1924.—The correlations among certain quantitative characters of maize have been studied in a hybrid between the smallest and one of the largest varieties. While apparently there are a great many heritable factors involved in the several differences between large and small varieties of maize, the correlations among the characters of size often are low or negligible and there seems to be no genetic obstacle to forming recombinations of desirable quantitative characters by hybridization.—*Author.*

4341. Kirk, L. E. **Aberrant forms in Arctic sweet clover.** Sci. Agric. 5: 113–116. 1924. —Descriptions and photographs are given of a number of peculiar forms which appeared in an "increase" field of Arctic sweet clover. Certain of the characters appearing and the fact that this field was adjacent to a field of Grimm alfalfa led the writer to suggest the possibility of natural hybridization with the alfalfa.—*T. G. Major.*

4342. Kotowski, Feliks. **Opis kilku odmian handlowych kapusty głowiastej. [Descrip-**

tion of some commercial varieties of cabbage.] Roczników Nauk Rolniczych **10**: (1–25). 1923. (For abstract see this issue, Entry 4385.)

4343. Kvakan, P. **The inheritance of brown aleurone in maize.** New York Agric. Exp. Sta. Mem. [Cornell] 83. *1–22.* 1924.—A new pigment of the aleurone cells of maize has been found to be identical with "pale yellow endosperm." This new aleurone color which is light brown has been given the designation *Bn* and is unrelated to the other aleurone factors hitherto known.—Linkage tests place this new factor in a chromosome with *Ra-Gl-V*$_5$, the probable order being either *Ra-Bn-Gl-V*$_5$ or *Bn-Gl-V*$_5$*-Ra.*—*J. H. Kempton.*

4344. Leighty, C. E., and W. J. Sando. **Pistillody in wheat flowers.** Jour. Heredity **15**: 263–268. *Fig. 15–16.* 1924.—Numerous abnormal flowers were observed, in 1923 and 1924, in several plants of common wheat (*Triticum vulgare* Vill.) growing in the greenhouse of the U. S. A. Department of Agriculture, at Arlington Experiment Farm. These malformations involved partial or complete transformation of 1, 2 or all 3 stamens of many flowers either into carpels, or into structures partly stamens and partly carpels. The "extra carpels" did not develop into kernels. Certain of the central carpels of malformed flowers developed into kernels, the "extra carpels" appearing as scale-like appendages of the mature kernels. The abnormal condition did not reappear in 1924, in 18 plants grown from seed produced by the plants showing these abnormalities in 1923.—*C. E. Leighty.*

4345. Leighty, C. E., and J. W. Taylor. **"Hairy neck" wheat segregates from wheat-rye hybrids.** Jour. Agric. Res. **28**: 567–576. *Pl. 1–5.* 1924.—The upper portion of the peduncle of cereal plants, just below the spike, is often called the "neck." In rye the neck is usually partially or entirely covered with short hairs, while in wheat it is glabrous. Ten plants resembling wheat in most characters, but having the hairy neck, selected in 1922 from the progeny of wheat-rye hybrids, produced 8–100% hairy-necked plants the next year. Although hairy-neck is evidently a heritable character, considerable irregularity in segregation was apparent, both dominant and recessive tendencies being observed. These phenomena may be related to probable irregularities in chromosome behavior. The number of factors involved or the manner of their transmission was not determined. The F_1 wheat-rye hybrid produced no seed when bagged, but when open pollinated showed 0.66% fertility. Wheat pollen is apparently the fertilizing agent, for in later generations self-fertile lines are soon established, usually with no definite indication of rye parentage. The results here reported indicate that it is possible to obtain plants combining certain characters of the wheat and rye parents.—*Authors.*

4346. Lewicki, S. **O pewnej mutacji Triticum durum i o jej znaczeniu dla filogenetyki pszenicy. [A new mutation in Triticum durum and its importance for the phylogenetics of wheat.]** Pam. Pánst. Inst. Nauk. Gosp. Wiejsk. Pulawach **3**: 61–82. *1 pl.* 1922.—A mutation (illustrated) found (1921) in a pure line of *Triticum durum* var. *coerulescens* was characterized by fragility of the spike and by hairiness at the base of the spikelets, characteristics of the wild wheat *T. dicoccum dicoccoides* Kcke., the hypothetical ancestor of wheat. All characters of this mutation were inherited by its offspring. The mutation had leaves like durum in color and form and brownish-black spikes and awns and pith-filled culms like the var. *coerulescens*, but had a spike differing from, though resembling, all 3 species. The grains were closely covered by the glumes. The glumes approached *durum* in form, but in ratio of length to breadth were intermediate between *durum* and *dicoccoides*. The spikelets were similarly intermediate in this ratio. The mutation in general resembled *dicoccoides* and *durum* more than *dicoccum*. In a discussion of the characteristics of mutations in general, the designation "passive mutations" is suggested for such changes of plasma structure, resulting from loss of the former state of equilibrium and by new arrangement of the genes and involving neither loss nor appearance of genes. The literature relating to analogous mutations is reviewed. The relation of the present mutation to contemporary theories of the phylogeny of wheats is discussed. The author believes that *dicoccoides* was the original form, that it gave rise directly to both *dicoccum* and *durum* and quite likely also to *polonicum*, but that *turgidum* probably arose from *durum.*—*C. E. Leighty.*

4347. Lewicki, S. **Rzadkie mieszańce: ♀ Trit. polonicum var. eucompactum Aschers. et Gräbn. × Trit. monococcum var. flavescens Kcke. [The rare hybrid: Triticum polonicum**

eucompactum × T. monococcum flavescens.] Pam. Pánst. Inst. Nauk. Gosp. Wiejsk. Pulawach 3: 343–356. *1 pl., 1 fig.* 1922.—Five seed obtained in the cross *Triticum polonicum eucompactum × T. monococcum flavescens*, made in 1921, produced 5 well-developed plants, on which detailed data are recorded. These F_1 plants were intermediate between the parents in stooling and length of glumes, but surpassed the parents in height, length of spike, and number of spikelets, apparently showing in their growth a typical example of heterosis. Pronounced dominance of *monococcum* characters was evident in the hybrid. On blooming, the glumes remained open for a long period; the normally developed anthers were extruded, dehisced, and shed their pollen. The pollen grains, however, were poorly developed and empty, or nearly so. All the plants were completely sterile, as have been also the hybrids made by others between *monococcum* and the species *dicoccum*, *durum*, *turgidum*, and *vulgare*. *Monococcum* can be considered, then, as the most remote and the most isolated in the phylogenetic order of the genus; and, furthermore, as the most ancient, since its characters are dominant in hybrids with *vulgare* and *polonicum*.—*C. E. Leighty.*

4348. Love, H. H., and W. T. Craig. **The inheritance of pubescent nodes in a cross between two varieties of wheat.** Jour. Agric. Res. 28: 841–844. 1924.—A cross was made between a bearded, pubescent-noded, common wheat and a bald, smooth-noded wheat. In the F_1 generation pubescent nodes showed dominancy, with a fairly good fitting 1:2:1 ratio in the F_2, beardless-pubescent nodes being heterogygous. One factor for beards and pubescent nodes was assumed, although in the next generation a few bearded glabrous-noded plants made their appearance. Perhaps 2 very closely linked factors are responsible for beardedness and pubescent nodes. Pubescent nodes and glumes were inherited independently.—*L. R. Waldron.*

4349. Lush, Jay L. **Twinning in Brahma cattle.** Jour. Heredity 15: 25–27. *Fig. 14–15.* 1924.—There are many thousands of cattle on the coastal plains bordering the Gulf of Mexico, which are crossbreeds between *Bos indicus* and *Bos taurus*, or are descendents of such crossbreeds. These cattle are known as Brahma cattle among the cattlemen of that region and on account of their inter-specific origin they are of especial interest. No evidences have been found of any sterility either in the 1st cross or in later generations. This article reports 1 case of presumably identical twins and another case of a ♀ twinned with a ♂. This ♀ appeared to be a free-martin. The free-martin has been studied extensively only in *Bos taurus* and it would be interesting to know how widespread its occurrence is among the Bovidae.—*Author.*

4350. M., E. W. **Social biology and birth control.** Nature 113: 773–775. 1924.—The post-war period finds an acute problem confronting Great Britain. Industrial depression, restriction of immigration to the U. S. A., and a growing tendency of people to depend upon government for support tend to make it more difficult for the nation to sustain a growing population than in pre-war periods. If no remedy be applied, famine will doubtless reduce the population to an economic level. Now the poorest and least competent members of society reproduce fastest and motherhood pensions would augment this condition and cause the state to consist more and more of these types. As the professional classes have a lower rate of increase, due to late marriage and birth restriction, the proposal is made to instruct the recklessly reproducing poorer classes in method of birth control. This would not prove entirely effectual but a public opinion might be created for sterilization of those producing such families as would be a burden on the state. Thus the present policy of natural selection should be gradually replaced by rational and painless selection.—*C. V. Green.*

4351. Oehlkers, Friedrich. **Sammelreferat über neuere experimentelle Oenotherenarbeiten.** [**General review of recent experimental investigations in Oenothera.**] Zeitschr. Indukt. Abstamm.- u. Vererb. 34: 259–283. 1924.—The author gives a general review of the Oenothera investigations, based upon a presentation of the essential features of studies recently reported. He divides his presentation into 4 sections: (1) The original Oenothera problem and the controversy concerning the nature of *O. Lamarckiana;* (2) Heterogamy in Oenothera; (3) Oenothera cytology and heredity; and (4) Factorial analysis in Oenothera investigations. In the last section results obtained by European and American investigators are treated separately.—The author emphasizes the importance of an analysis of types into

their constituent haplonts, the significance of genetic findings and of the phenomena concerned in heterogamy, and the necessity finally for a complete factor analysis, which presents special difficulties in Oenothera, but which it now seems possible to surmount.—The list of literature cited consists of 33 titles.—*R. E. Clausen.*

4352. Parkes, A. S. **Studies on the sex-ratio and related phenomena. II. The influence of the age of the mother on the sex-ratio in man.** Jour. Genetics **14**: 39–47. *2 fig.* 1924.—The investigation is based upon the records of St. Mary's hospital, Manchester, concerning the maternity details of over 8000 patients. The abortion rate was found to rise from 1.7 per 100 births in the case of mothers 13–17 years of age to 41.4 in the case of mothers more than 43. The still-birth rate rose from 8.7 in the case of mothers 18–22, to 28.4 for mothers 43 and older. Abortion-rate rose from 5.7 for 1st pregnancies to 44.4 in the case of 8th and higher pregnancies. The number of still births also increases in later pregnancies. It has previously been shown that abortion falls more heavily on males, so the author tentatively concludes that age of mother and order of birth operate through the maternal organism of mammals by unequal elimination of sexes after sex-determination, but previous to the time at which the sex-ratio is usually assessed. Thus it is possible that the mother may have some influence on birth sex-ratio while the male, however, may be the sex-determining parent.—*C. V. Green.*

4353. Prell, Heinrich. **Der Vererbungstheoretische Charakter der Parthenogenese. [The character of parthenogenesis according to the genetic theory.]** Genetica **5**: 191–208. *8 fig.* 1923.—The author defines parthenogenesis as egg development without sperm fertilization. The different kinds of "gamy" and "mixis," according to the degree of genealogical relationships between conjugating gametes, are discussed. Correspondingly different modes of parthenogenesis have to be distinguished. The author therefore divides the parthenogenesis into 2 main classes (true or apomictic versus false or amphimictic) and several subdivisions, based upon a particular maturation division of the egg.—*L. A. Waitzinger.*

4354. Ranganatha Rao, V. N. **Mysore cottons and their improvement.** Trop. Agric. [Ceylon] **63**: 210–213. 1924.—This is a report of progress in improving by selection the 3 principal types of cotton grown in Mysore. One of these, a naked-seeded form, was considered by Watt to be a hybrid between a member of the American group and one of the Asiatic group. This is doubted by the author because he and Hilson had been unsuccessful in crossing representatives of these groups.—*T. H. Kearney.*

4355. Rümker, K. von. **Die Saatenanerkennung, ihre augenblickliche Lage und ihre Bedeutung für die landwirtschaftliche Produktion. (Seed certification, its present status and its significance for agricultural production.]** Mitteil. Deutsch. Landw. Gesell. **37**: 207–211. 1922.—Seed certification in Germany was an outgrowth of the work of the early agronomists and plant breeders in varietal testing and improvement of varieties. The 1st certification of seed was made in 1897 by the German agricultural association. The accompanying field inspection and subsequent testing gave assurance to the buyer of reasonable trueness to type, purity, soundness, and of good condition of the seed. A "high-bred register" was established in 1905 in which the pedigree and performance of new sorts are recorded. The objects of certification and suggestions for the future procedure are discussed. A list of 23 German articles on the subject is included.—*C. E. Leighty.*

4356. Schürhoff, P. N. **Die geschlechtsbegrenste Vererbung der Kleistogamie bei Plantago Sect. Novorbis. [The sex-limited inheritance of cleistogamy in Plantago Sect. Novorbis.]** Ber. Deutsch Bot. Ges. **42**: 311–321. *1 fig.* 1924.—Normal fertilization and embryo development occurs in *Plantago*. The factor for cleistogamy is apparently linked with the sex chromosome so that cleistogamous plants are females. The behavior of cleistogamy in other plants is discussed.—*Karl Sax.*

4357. Shamel, A. D., C. E. Pomeroy, and R. E. Caryl. **Bud selection as related to quantity production in the Washington Navel orange.** Jour. Agric. Res. **26**: 319–322. *2 pl.* 1923.—This is the 1st of a series of reports recording the behavior of progeny propagations of a number of limb variations which were found during fruit improvement studies with the Washington Navel orange. In this case a large limb in a tree which had developed from a single bud was found to be almost entirely barren. Progeny trees grown from buds from the

limb-variation and from the normal part of this parent tree reproduced this quantity production character, indicating the importance of careful selection of budwood in commercial propagation.—*C. S. Pomeroy.*

4358. Shiwago, P. J. **The chromosome complexes in the somatic cells of the male and female of the domestic chicken.** Science 60: 45–46. 1924.—All chromosomes of the domestic chicken were found to be rod-shaped with a marked uniformity in breadth, namely, about 0.5 micron. There appears also to be a characteristic symmetrical arrangement of chromosomes during different states of mitosis. The somatic number of chromosomes in the ♂ is 30 + 2x chromosomes. In the ♀ the number is 30 + x + y. The x chromosome is among the largest while the y is very small.—*F. A. Hays.*

4359. Spemann, H. **Vererbung und Entwicklungsmechanik.** [Heredity and mechanics of development.] Zeitschr. Indukt. Abstamm.- u. Vererb. 33: 272–294. 1924.—In ligated Triton egg, halves are connected by slender stalk. The egg and sperm nucleus occur in one of the halves, in the other half only the extra sperm nuclei are present. The former half segments to the 8-cell stage, the latter not until in the 4th cleavage, when 1 daughter nucleus passes from a cell in the segmenting half passing through the connecting stalk, whereupon cleavage starts in the other half and a normal embryo may be produced.—This result follows only if constriction is median. The 1st cleavage in some cases is median, in others it separates dorsal from ventral side. Ligation at the beginning of gastrulation, in the median plane, results in 2 embryos; if in the plane separating dorsal and ventral, only the dorsal half produces embryo. Ligation in the unsegmented egg stage gives the same 2 possible results. Since the egg nucleus may go into either dorsal or ventral half, the nucleus is not determinative. If the nucleus goes to the ventral half and divides more than 3 times before the daughter nucleus goes into the dorsal half, normal development in the dorsal half does not occur. In the case of median ligation, the egg nucleus may divide 4 times and still produce normal development on passing to the opposite side. The results indicate a change in the nucleus, occurring earlier in the dorso-ventral separation than in the median separation; hence the change is due to the cytoplasm instead of the nucleus.—If, at the beginning of gastrulation, bits of ectoderm destined to become medullary plate and epidermis, respectively, be exchanged in position, each becomes tissue proper to its new location, but not what it would have become. Two pieces need not be of exactly the same age to effect this exchange. If the exchange is made at the end of gastrulation, the bit of epidermis is cast out of the medullary plate, while the piece of medullary plate sinks below the epidermis and becomes part of the brain. Pieces of ectoderm of *Triton cristatus* transplanted by Mangold into *T. taeniatus* have dropped beneath the ectoderm and entered into the composition of the gut, muscles, or pronephros. At the beginning of gastrulation, the region of the lip of the blastopore has advanced further in its determination than other regions and constitutes the center of organization. Other centers follow. When such centers are transplanted to an undetermined region of another embryo, they cause differentiation in the adjoining tissue of the host in conformity with the determination which has already occurred in the transplanted piece. Thus ear vesicles, notochord, and pronephros have been formed largely out of host tissue which would have become something else but for the transplantation into its midst of center of organization from *T. cristatus.*—These experiments are opposed to Weismann's views of mechanics of development, which were evolutionistic, and favor epigenesis. The article contains a lengthy discussion of Weismann's theories, the experiments of Boveri and Hertwig, and Goldschmidt's theories of sex and development.—*A. Franklin Shull.*

4360. Stockard, C. R. **The structure of the vertebrate eye as an index of developmental deficiencies, with the bearing on recent inheritance studies.** Amer. Nat. 58: 24–35. 1924.—The embryonic development of vertebrate animals normally takes place at definite rates. The rate changes during different development stages, but is in general typical for the given species. The vertebrate eye is the 1st actual organ to arise, appearing as an enormous outgrowth of the forward end of the neural folds. The neural plate follows closely after gastrulation. Thus the eye arises soon after the primary embryonic axis is established and its development continues with the differentiation of the retina, the ingrowth of the optic nerve fibres from the retinal ganglion along the optic stalk and the addition and differentiation of

numerous accessory parts—lens, humors, glands, muscles and lids. The eye frequently shows maldevelopment in both primary and secondary structures and this fact is to be correlated with its long period of development. Any interruptions during this time might mar the perfection of the eye. The eye is definitely a susceptible and responsive organ during development. With this in view it seems safe to consider the vertebrate eye as an indicator of developmental deficiency and to question the specificity of origin of any eye-anomaly. It is probably often true that when developmental arrests are present in various body organs, the eyes of such an individual are also structurally deficient, and vice versa. The blind and eyeless form in nature is probably a weaker, less well developed animal than its nearest relative. The more hardy and active form is never the cave-living one. Possibly the structural defect has caused the animal to remain in the cave.—*Isabel Potter.*

4361. Stomps, Th. J. **Erblichkeit und Chromosomen. Eine gemeinvertständliche Darstellung. Aus dem Holländischen ins Deutsch übersetzt von Paul dall'Arni. [Heredity and chromosomes. A popular presentation.** Translated into German from the Dutch by Paul dall'Arni.] *158 p. 24 fig.* G. Fischer: Jena, 1923.—This is a general treatment of cytological phenomena with particular reference to heredity. The book is divided into 3 parts. Part I, The chromosomes, contains chapters on the structure of the protoplast, cell and nuclear division, and reduction division.—Part II, Heredity, contains chapters on the physical bearers of heritable characters and on the localization of heritable characters.—Part III, The chromosomes, the physical basis of heredity, contains chapters on observations on the significance of the nucleus in the life of the cell, on Boveri's investigations on hybridization and merogony in sea urchins, on Herbst's investigations of artificial parthenogenesis with hybrid fertilization, on Boveri's investigations of double fertilization in sea urchins, on the chromosomes and sex, and on the chromosomes and Mendel's laws. Emphasis is placed on the nucleus as the seat of heritable materials, and illustrations are for the most part drawn from cytological sources. A bibliography accompanies each chapter.—*R. E. Clausen.*

4362. Strong, Leonell C. **Inheritance of cancer.** Jour. Heredity **15:** 355–360. 1924. —With the isolation of a single factor family as far as the physiological reaction to a transplantable tumor is concerned, the genetic theory for the transplantation of a cancerous growth is placed on a firmer basis. The theory may thus be stated; The fate of the transplanted tumor is dependent upon a reaction between the host (determined largely by its genetic constitution) and the transplant (determined, to a large extent at least, by its genetic constitution). The physiological functions of the host follow the same laws of Mendelian inheritance as do morphological characteristics. The growth rate of a particular transplanted tumor depends as much upon the genetic constitution of the host as it does upon any of its own peculiarities. Genetic phenomena are encountered in the study of the growth rate of the transplant in various hybrid generations. Regression of the transplant depends upon an inherited genetic constitution of the host harboring the transplant. The application of the transplantation work to problems of genetic physiology and the probable significant bearing on the so-called cancer problem is briefly considered.—*Author.*

4363. Strong, W. J. **Strawberry breeding at the Ontario Horticultural Experiment Station.** Sci Agric. **4:** 217–222. 1924.—Breeding work with strawberries began in 1913 with the object of producing "a strawberry with the quality of the Brandywine, the earliness of Early Ozark and the firmness of Williams (of Ontario) combined in one berry without the undesirable qualities of each." Tables are given showing the crosses made and the pedigrees of certain of the parents used. In all, 9,219 seedlings have been produced and of these, 12 seem worth while carrying on.—*T. G. Major.*

4364. Sutton, E. P. Foquett. **Inheritance of "bolting" in cabbage.** Jour. Heredity **15:** 257–260. *Fig. 12–13.* 1924.—In a natural state the cultivated cabbage (*Brassica oleracea*) is a biennial. Certain strains, however, being sown in late July and early August (a method of culture which is much practised by English market growers) produce good solid heads in the following spring, and do not run to seed until the 3rd year. Other strains sown at the same time run to seed in the 2nd year instead of forming heads, though they may be perfectly suitable for spring sowing to head in the same year and run to seed the next.—"Tendency" to run to seed or bolt in the 2nd year, from July and August sown seed, is tentatively put forward as

a Mendelian recessive character, as the following example may prove, though the figures given, are very limited, owing to the difficulty of obtaining seed from plants seeded under control.—Green heading (non-bolting strain) ♀ × red heading (bolting strain) gave in the F_1 dilute red heading. The F_2 ratio was 27 red heading: 18 green heading: 10 red bolting: 3 green bolting.—*Author.*

4365. Thomson, J. Arthur. **What is man?** *ix + 331 p.* G. P. Putnam's Sons: New York & London, 1924.—This book contains 10 lectures delivered at the United Free Church College of Aberdeen, Scotland, in 1922, explaining in a simple way how biologists regard man. The chapter headings are: Man's pedigree; primitive man; evolution of man's mind; man as a social person; behavior and conduct, variability and inertia; sifting and winnowing, including selection by disease, the conflict of tribes and races, sex selection in man, and eugenics; contact of races, including inbreeding and outbreeding, population problems, and climate and geography; disharmonies and disease; what man is not, including a discussion of evolution, its trend, its progress, and as to whether it is going to stop. Fifty or more titles of "useful" books on this subject are appended.—*Orland E. White.*

4366. Verret, J. A. **Bud selection. A preliminary report on results and methods.** Hawaiian Plant. Rec. **27:** 271–282. *Illus.* 1923.—A brief statement is given of the results in 1923 from some of the experimental progeny propagations of sugar cane variations made by A. D. Shamel. In these tests number and size of stalks and habit of growth were reproduced in the respective progenies. A more complete report is to be made when the full data are available.—*C. S. Pomeroy.*

4367. Walter, H. E. **Tryhybrid blocks.** Amer. Nat. **58:** 476–478. 1924.—A device for visualizing the possible combinations in the F_2 generation of a trihybrid consists of 64 similar cubical wooden blocks and 3 arbitrary symbols, squares, circles and triangles that may represent desired actual characters. These symbols are painted on the blocks, opposite faces being alike. The symbol always appears double, one partially over-lapping the other, representing zygotes. Symbols in solid represent dominant homozygotes, those in outline indicate the homozygous recessive and those in solid overlapped with outline, the heterozygous condition. By rearranging the blocks other things may be illustrated: (1) A trihybrid is simply a combination of 3 monohybrids; (2) Mendelian explanation of apparent blending inheritance by means of duplicate genes; (3) the variability curve in the F_2 which indicates that blending inheritance may receive a satisfactory explanation upon a strictly Mendelian basis.—*Isabel Potter.*

4368. Wentz, John B. **Miniature germ in maize.** Jour. Heredity **15:** 269–272. *Fig. 17–19.* 1924.—A defective seed type in maize is reported, in which the germs are exceedingly small. In some of the seed no germ can be found at all, while in others there is a distinct but very small germ area. This type came from a selfed ear of a yellow dent strain and data are presented which show that the character is inherited as a simple Mendelian factor. A small percentage of the miniature germ kernels produced mature plants.—*Author.*

4369. Wilson, Edmund B. **The cell in development and heredity.** *3rd ed. revised and enlarged. xxxvii + 1232 p. 529 fig.* The Macmillan Co.: New York, 1925.—The 2nd edition of this work appeared in 1900, the year in which Mendel's laws were rediscovered. Since then, the subject matter has increased so enormously that the new edition as compared with the 1st edition (1896) contains over 3 times as many pages. The contents are grouped under the headings of: Introduction; general morphology of the cell; cell division; reproduction and the life cycle; the gametes, including origin, growth and differentiation of the germ-cells (animals) and gamete formation (plants); fertilization, parthenogenesis and related phenomena; maturation and reduction (meiosis); reproduction and sexuality in lower organisms; some aspects of cell-chemistry and cell-physiology; some problems of cell-organization; chromosomes and sex; morphological problems of the chromosomes; heredity and chromosomes; growth, cell division and development; development and heredity; glossary; general literature list of over 50 pages. The book is indexed by author and by subject.—*Orland E. White.*

4370. Witschi, Emil. **Ueber bestimmt gerichtete Variation von Erbfaktoren. [Definitely directed variation of genetic factors.]** Studia Mendeliana. *P. 288–315. 10 fig.* Typos: Brünn, Czechoslovakia, 1923.—Factors which contribute to the formation of new species from

a genetic point of view and which give phylogenetic sequences should be fully investigated. A review is given of mutation groups occurring in nature and those experimentally produced. Orthogenetic sequences in sex differentiation for various classes and families in the plant and animal kingdom are shown. Causes of sex determination are discussed, especially using the author's own experiments on frogs as a demonstration. A relationship between sex differentiation and geographical distribution seems to exist in frogs. Sex intergradations in frogs are compared with those in plants studied by Yampolsky, and Correns. Guyer's view of the change of a gene through products of internal secretion seems to be verified in frogs. The genotypic change in the frog is explained by a change of the sex factors. Another category of hermaphrodism is that studied by Junker on *Perla marginata*. The author's proof of a phenotypic induction is not identical with the inheritance of acquired characters.—*L. A. Waitzinger.*

4371. Woodworth, C. M., and L. J. Cole. **Mottling of soybeans.** Jour. Heredity **15**: 349–354. *Fig. 18–19.* 1924.—Mottling in soybeans is described. Examination, pod by pod, of 155 plants in a pure line of a mottled variety showed a striking similarity in type of mottling in seed from the same pod. Seed from different pods on the same plant, or even on the same peduncle, did not show the same similarity in mottling. The identity in type of mottling was not exhibited by seed in the same pod borne by progeny plants. The mottled character is believed to be due to physiological or environmental factors rather than to genetic factors.—*C. M. Woodworth.*

4372. Yocum, H. B., and B. I. Phillips. **Luteal cells and sexual dimorphism of feathering in wild birds.** Amer. Nat. **58**: 572–574. 1924.—A histological study was made on the gonads of both sexes of wild birds to discover if there is any relation between the presence or absence of luteal cells and sexual dimorphism in plumage color. Luteal cells were found in all ovaries but were not positively identified in any testes. No evidence could be found to show that plumage color is in any way dependent upon hormones from these luteal cells.—*F. A. Hays.*

HORTICULTURE

F. C. Bradford, *Editor*

(See also in this issue Entries 4008, 4015, 4034, 4035, 4040, 4088, 4116, 4128, 4129, 4134, 4218, 4225, 4232, 4249, 4294, 4300, 4313, 4319, 4335, 4355, 4357, 4363, 4364, 4583, 4603, 4610, 4633, 4634, 4651, 4773)

4373. Anonymous. **Test garden.** Missouri Bot. Gard. Bull. **12**: 134–137. *Pl. 39–40.* 1925.—Results of growing test varieties of asters, strawflowers, etc., are presented.—*O. T. Wilson.*

4374. Anonymous. **The orchid exhibition.** Missouri Bot. Gard. Bull. **12**: 127–129. *Pl. 34–37.* 1925.—Over 1000 plants brought back by the expedition to Colombia in 1923 were in bloom for the opening display on Nov. 30, 1924; 4000 more were in bud.—*O. T. Wilson.*

4375. Beckwith, Charles S. **Blueberry culture.** New Jersey Agric. Exp. Sta. Circ. 170. *1–8. Fig. 1–5.* 1924.—This is a popular discussion of blueberry culture, including a discussion of the wild in comparison with the cultivated blueberry on the market, soil and fertilizer requirements, harvesting methods and yield.—*Wm. H. Martin.*

4376. Blackmon, G. H. **The pecan industry in Florida and its possibilities.** Proc. Florida State Hort. Soc. **1924**: 145–149. 1924.—When properly cared for, trees make an exceedingly rapid growth in Florida. Three to four year old trees begin to bear. Commercial crops should be produced in 7–10 years after planting. The section best suited to pecan raising is from Jacksonville west to Pensacola and south to Gainesville.—*J. C. Th. Uphof.*

4377. Chace, E. M., and F. E. Denny. **Use of ethylene in the coloring of citrus fruit.** Indust. and Eng. Chem, **16**: 339–340. 1924.

4378. Culpepper, C. W., and C. A. Magoon. **Studies upon the relative merits of sweet corn varieties for canning purposes and the relation of maturity of corn to the quality of the canned product.** Jour. Agric. Res. **28**: 403–443. *Fig. 11.* 1924.—This paper records the results of 3 years' comparative study of sweet corn varieties, particular attention being

given to the rate of development in the field and the physical changes associated with it, the chemical transformations undergone in the kernel during the development and maturing of the ear, and the relation of the variety, stage of maturity, and other factors to canning quality. Fifteen well-known varieties of sweet corn and 2 varieties of field corn were used in this study. The time and the rate at which the varieties came into flower were found to be important criteria for determining when and how rapidly the ears would come to canning maturity. The rapid increase in toughness of the kernel during development was studied and a simple method devised for measuring the degree of toughness at any stage. The sugar content was found to reach its highest concentration at the same time, regardless of the variety; and the polysaccharide content of the kernels in sweet corn was found to be principally dextrin instead of starch as in the field varieties. The "thumbnail test" for maturity was found unreliable. From the standpoint of quality in the canned product the stage of maturity was found to be of far greater importance than the variety—all sweet varieties yielding a first quality product when canned at the proper stage of maturity. The varieties of field corn studies were not suited to canning purposes.—*C. A. Magoon.*

4379. Darrow, George M. **The American cranberrybush.** Jour. Heredity **15**: 243–253. *Fig. 1–10.* 1924.—In sections of the northern U. S. A. and in Canada, settlers for many years have used a native wild fruit, the cranyberrybush or high bush cranberry, which furnishes them jelly as rich in color and in pectin as that made from cranberries and currants. Because of the hardiness of the bush, its decorative value, and the amount, color and consistency of the jelly, selections of the best varieties are being made and propagated for later distribution. It is likely to reach its greatest value in those sections to which it is native or where the winters are so cold that there are relatively few other fruits. Its hardiness in northern Wisconsin and throughout Minnesota and North Dakota, where only the hardiest fruits are grown, suggests its particular value for such regions.—*R. C. Cook.*

4380. Daughters, Milo R. **A survey of citrus products.** Proc. Florida State Hort. Soc. **1924**: 136–138. 1924.—The following citrus products could be manufactured in Florida: essential oil, glucoside or bitter principle, pectin, candied peel, canned grape fruit, citrus fruit juice, citric acid and seed for oil.—*J. C. Th. Uphof.*

4381. De Busk, E. F. **The Satsuma industry of north and west Florida.** Proc. Florida State Hort. Soc. **1924**: 139–141. 1924.—The satsuma on trifoliata root stock is suited to a wide range of soils found in all the north and west Florida counties. Modes of cultivation and selection of groves are described.—*J. C. Th. Uphof.*

4382. Hartwell, Burt L., and F. K. Crandall. **On the amount of stable manure necessary for vegetable growing.** Rhode Island Agric. Exp. Sta. Bull. 195. *1–16.* 1923.—In a 3-year rotation: (1) beets—cauliflower, or ryegrass and clover, (2) spinach—beets, (3) eggplant. Liberal fertilizer is used and 32, 16 and 8 tons of stable manure are compared. The eggplant, especially, seemed to require more than the smallest application.—*B. L. Hartwell.*

4383. Huber, Howard F. **Lettuce growing in New Jersey.** New Jersey Agric. Exp. Sta. Circ. 155. *1–24. Fig. 1–15.* 1924.—Following a discussion of the lettuce industry in the U. S. A. the author discusses the areas in New Jersey in which lettuce is grown and also the climatic requirements of the crop. Directions are given for its culture including fertilization, varieties, preparation of the soil, growing the crop and insect and disease control measures.—*Wm. H. Martin.*

4384. Kotowski, Feliks. **Badania nad morfologją pędów kwiatonośnych (bąkòw) cebuli (Allium cepa L.).** [Morphological investigations on seed stalks of onion (Allium cepa).] Roczników Nauk Rolniczych **11**: (1–12). 1924.—The author investigated the morphology of seed stalks of onion using biometrical methods. The results are presented as a biometrical description of 185 specimens (population of "Zittauer" onion) in the year 1921.—Transverse sections of seed stalk made at the base, at the point of largest diameter, and near the top, have the following constant ratio of diameters: 2:4:1, and the largest diameter was always 28% of the total length of seed stalk above its base.—From the coefficients of correlation ($r \pm er$) it is evident that the length of seed stalk depends on the thickness of the stalk, especially in its lower part (at a point $\pm$ 30% of the total length above the base). Heavy and tall seed heads may be formed on the tops of long, heavy and sufficiently

thick stalks.—Trials of separate families of onions having different numbers of seed stalks were made during 1922 and 1923. Isolation of plants (self-fertilization) in 1921, and observation of their descendants in 1922 and 1923 showed no influence of this breeding method on the problem in question. However, a segregation based on the number of stalks formed during the summer, 1922, has given good results.—*From author's summary.*

4385. Kotowski, Feliks. **Opis kilku odmian handlowych kapusty głowiastej. [Description of some commercial varieties of cabbage.]** Roczników Nauk Rolniczych **10**: (1–25). 1923.—The author gives a biometric description of the following varieties (populations) of cabbage cultivated in Poland: Warsaw-cabbage (a very early, local variety), Brunswick, large Erfurt, small Erfurt and Magdeburg, all German varieties; "Ruhm von Enkhuizen," a Dutch variety; Amager, a Danish variety; Haage A. Schmidt Erfurt (H. S.) from Germany; and "Granum" (G) from the Polish commercial seed houses. The weight and volume of head were used for determining the compactness. The volume was found by the formula: $V = d_1^2 \cdot d_2 \cdot \frac{\pi}{6}$, where d_1 = horizontal diameter, and d_2 = vertical diameter. The conclusions were: (1) "Ruhm von Enkhuizen" was the best material for breeding purposes; (2) Warsaw Grabowski and Brunswick H.S. have been improved and are good commercial varieties; (3) the other varieties should not be used as breeding material.—*From author's abstract.*

4386. Kraus, E. J. **Studies in nutrition as guides in horticultural practice.** Sci. Agric. **5**: 18–21. 1924.—Attention is drawn to the necessity of careful studies in plant nutrition, including the effects of variable structure and environment, in order that reliable data may be secured on which to base practical recommendations. Some important contributions to this field are cited.—*T. G. Major.*

4387. Kraus, E. J. **The inter-relation of growth and fruitfulness in plants.** Sci. Agric. **5**: 62–65. 1924.—This is an outline of the problems to be faced in the study of plant nutrition as affecting vegetative growth and fruiting. The chief problems mentioned are the interdependence of vegetative extension and the production of fruits, the point in the range of the various degrees of vegetativeness at which fruiting is at a maximum, the nutrient relations associated with different degrees of vegetativeness and fruitfulness, the influence of fruits on growth, and the effects of light.—*T. G. Major.*

4388. Lagatu, H., et L. Maume. **Étude par l'analyse périodique des feuilles, de l'influence des engrais de chaux, de magnésie et potasse sur la vigne. [A study by periodic analysis of leaves, of the influence of calcium, magnesium, and potassium fertilizers on the grape.]** Compt. Rend. Acad. Sci. Paris **179**: 932–934. 1924.—This is a continuation of the study (Ibid., p. 782). The yields of grapes are given after addition of complete fertilizer to the soil, and with this fertilizer without potassium, with calcium, and with calcium and magnesium, respectively. The complete fertilizer alone gives the best results in all cases. The fertilizer with calcium and the control are 10–30% below this optimum. The fertilizer without potassium is the poorest, being 30–46% below the optimum. Graphs are given of the alkalinity of leaves in the different months of the season for vines on these variously fertilized soils.—*C. H. Farr.*

4389. McCollam, M. E. **Mangel and carrot varieties.** Bi-Monthly Bull. Western Washington Exp. Sta. **12**: 4–7. *1 fig.* 1924.—Comparative yields of 7 varieties of mangels and 6 of carrots grown on manured muck soil for 5 or more years.—*F. D. Heald.*

4390. Morales, J. J. **Flores cortadas; conservacion e importancia de su exploitacion en Mexico. [Cut flowers; methods of keeping them and the importance of developing the industry in Mexico.]** México Forest. **2**: 117–121. 1924.—The flower business in Europe and America is discussed briefly. Before the Conquest, Mexico had some of the most magnificent gardens in the world for growing flowers and medicinal plants, but these were neglected after the Spaniards came and Mexican floriculture is said to be now in complete decadence. This potential source of national wealth deserves attention.—*W. N. Sparhawk.*

4391. Morris, O. M. **Stationary spray plants.** Washington [State] Agric. Exp. Sta. Popular Bull. 121. *1–20. Fig. 1–9.* 1924.—This is a field study of 12 different plants used by orchardists of the Wenatchee district. Well installed systems have proved efficient and economical.—*F. D. Heald.*

4392. Nichols, Roland A. **The Florida Marvel blackberry.** Proc. Florida State Hort. Soc. 1924: 166–169. 1924.—This gives a description and cultural directions for the new Florida Marvel blackberry under Florida conditions.—*J. C. Th. Uphof.*

4393. Robinson, T. Ralph. **Breeding work with reference to citrus stocks.** Proc. Florida State Hort. Soc. 1924: 25–31. 1924.—In the southwestern region of the U. S. A. and in Texas where the winters are quite cold, Citrus trifoliata does not thrive. It is believed that an excess of lime is a contributing factor to poor growth. In the lower Rio Grande Valley neither rough lemon nor the trifoliata orange can be used successfully, only the sour orange being suited to the silty soils. Recently the citrange has been found suitable as stock where neither parent of this hybrid could be successfully used; it is, however, susceptible to citrus canker.—*J. C. Th. Uphof.*

4394. Ryerson, Knowles. **Embryo budding of the avocado.** Jour. Heredity 15: 33–37. *Fig. 19–22.* 1924.—A recently developed method of embryo-budding of the avocado is being used in California to shorten the period required for the fruiting of seedlings. It consists in inserting the germinating embryo as a bud either on a seedling or on the larger limb of a grown tree. One cotyledon is removed from the sprouting seed when the 1st root is about 1½ inches long. The radical is split from the base to the tip. The other cotyledon may or may not be partly cut away. The cotyledon so prepared is inserted in a regular "T" incision and held in place by budding rubber until union has been effected. Dentist's rubber sheeting is used to cover the bud to prevent drying out. The union takes place above the point of origin of radical and cauticle, the rootlet eventually dying. The seedling makes a very rapid growth. The operation is not at all difficult.—*Author.*

4395. Shull, J. Marion. **Aspirin injurious to cut flowers.** Flower Grower 12: 29. *Fig. 1.* 1925.—A recently wide-spread popular report relative to the use of aspirin in connection with cut flowers is here refuted as the result of controlled experiments. Various wild and cultivated species were placed as cut flowers in dilute solutions of aspriin and in plain tap water. In all cases the addition of aspirin produced notably injurious results, usually apparent within 24 hours and as a rule first manifested by tip and marginal scalding and later by the complete drying up of foliage parts. In some cases, the collar just beneath the flower or flower head proved particularly susceptible, bringing about premature drooping, while the petals or floral bracts in some instances became discolored in advance of complete collapse.—*Author.*

4396. Skinner, R. E. **Some observations on citrus root stocks.** Proc. Florida State Hort. Soc. 1924: 17–23. 1924.—The first groves planted in Florida were of seedlings. Varieties are now budded on sour-orange, lemon, grapefruit and *Citrus trifoliata.* The last thrives best in northwestern Florida but is not suited for the south. Sour orange root is more cold resistant than grapefruit or rough lemon. It tends to keep the tree in a more domant condition in winter. The Parson Brown variety does better on sour orange than on lemon. The nature of the soil is of importance in stock selection. For use in growing stocks, careful selection of seed from mother plants is advised. Seedlings of the Cleopatra stock are considered cold resistant.—*J. C. Th. Uphof.*

4397. Stahel, Gerold. **Verslag van een dienstreis naar Centraal-Amerika.** [**Report of a study in Central America.**] Dept. Landb. Nijverheid. en Handel Suriname Bull. **45.** *1–73. 18 pl.* 1924.—Formerly coffee was much grown in Venezuela, but it is now replaced by cacao plantations. When fruits are picked they are transported by mules and sent to the drying floor. There they are shelled and placed in baskets, and then fermented in large cement containers; the floors and beans are covered with banana leaves. Here the seed remain for 1 day spread out over the drying floor. When warmed by the sun, they are placed in heaps and covered in order that fermentation may continue for 1 night. The 3rd day the seed are spread out again, fermentation being finished. The seed are dried in the sun within a few days. Most plants are of the Criollo legitimo variety, but a few are of the yellow Criollo amarillo. Some are hybrids between cacao dulce and cacao amaro. Trees are planted 12–15 feet apart; on less fertile soil 10 feet apart. *Erythrina glauca, E. umbrosa, Pithecolobium Saman* and sometimes *Anacardium rhinocarpus* are used as shade trees for cacao plants. Cacao trees bear the entire year when properly irrigated, or at least from January to February and from

June until August. The Dutch island of Curaçao is described; on account of the drought, irrigation is constantly necessary, water being pumped by American windmills. The cacao production of Colombia is described as inadequate for the supply of the country. Cacao growing and fermentation in eastern Costa Rica, especially by the United Fruit Company, is mentioned. An Inga species is much used as a shade tree for the cacao. The Amenado, a type of the Forastero cacao, is commonly grown and is much more resistant against the very moist climate than plants of the Criollo type, which are here subject to canker. The latter type is more generally found near the drier west coast of Costa Rica. Cacao beans are rarely sown in beds but usually directly in the plantation, 3 beans near one another. Formerly the trees were set at a distance of 10 feet, later at 12 and now at a distance of 15 feet. The soil water level should be not less than 4 feet below the surface, otherwise cacao and Ingas may suffer considerably. Production is 200–300 kgm. per acre, sometimes 400–450 kgm. The principal harvest time is from May until June, the small harvest from October to November. The soil of some plantations is covered with asphalt paper which is very successful in the control of weeds. Some seedlings of *Theobroma bicolor* are grown as stock, but probably will not be successful. The wild *T. siminarum*, which is more related to *T. cacao* than is the *T. bicolor*, was suggested as stock. Near Zent cocoanut palms were once extensively cultivated, but suffered severely from heart rot and red ring disease (*Ashelenchus cocophilus*). Near the dry west coast this palm is more successfully grown. In banana plantations the plants are set 21–22 feet apart on rich land, and 14–16 feet apart on poor land. The soil water level should be at least 3 feet below the surface. No suckers are used for planting but rather pieces of the old tubers having 2 good eyes. They are planted with the eyes directed downward, a practice which is common in Suriname. The cost of planting 1 acre of bananas is $25.00, exclusive of cost of drainage. The varieties Dwarf, Bumulan and Congo are rather resistant to the Panama disease. Of pineapples which are grown near Santa Clara, the Red Spanish is raised for export, although the Santa Clara has the best flavor. Harvesting takes place 18 months after planting, averaging 7000 fruits to the acre. The plants may suffer from *Thielaviopsis paradoxa* and *Heterodera radicicola*.—Balsam wood (*Ochroma lagopus*), a very light wood, is used as insulation in ice boxes, etc. When trees are grown close together they produce a hard wood; when grown at wide intervals the wood is light. In the Atirro Estates, coffee and bananas are mainly grown. Coffee trees are set 10 feet apart; at each 4th tree a shade tree (*Inga* species) is planted. A description of banana growing on low land and at higher altitudes, 600 to 700 m., is given. Orange growing on the Navarro farm is described; Washington Navel orange is grown for export; Valencia, Jaffa and Majorca are raised for the home market.—*J. C. Th. Uphof.*

4398. Upshall, W. H. **Identification of varieties of fruit trees from leaf and other characters.** Sci. Agric. 4: 184–189. 1924.—A preliminary study was made of the growth characters of 20 varieties of pears, 23 of peaches, 30 of cherries and 27 of plums. Peach varieties may be distinguished by the presence or absence of yellow coloring in the leaves, and by the shape of the glands appearing at the base of the leaf-blades. These glands are either globose or reniform. In sweet cherries the number of glands, with their shape and position, the size and shape of buds, and the general shape and serrations of leaves form a basis for varietal distinction. Varietal differences have been readily observed in pears and plums but the work is incomplete. The economic importance of these studies is discussed and a list is given of the varieties being compared.—*T. G. Major.*

4399. Varga, F. **A növények dugványokkal való szaporitásáról. [Propagation of plants by cuttings.]** Herba 7⁴: 156–167. 1924.

4400. Weathers, John. **My garden book: prepared for the daily use of all who own a garden big or little.** *xvi* + 774 *p. Pl. 24.* Longmans, Green & Co.: London, 1924.

4401. Young, Floyd D. **Notes on the Weather Bureau fruit-frost service in southern California.** Bull. Amer. Meteorol. Soc. 4: 17–18. 1923.—The temperature survey work of the Weather Bureau is briefly noted. A decrease in fruit loss is mentioned where orchard heaters have been used. The Weather Bureau is credited with much of the saving through its timely and accurate warnings of impending low temperatures.—*Earl S. Johnston.*

ANATOMY, MORPHOLOGY AND HISTOLOGY OF VASCULAR PLANTS

E. W. Sinnott, *Editor*

(See also in this issue Entries 4029, 4144, 4180, 4185, 4232, 4304, 4344, 4384, 4398, 4539, 4552, 4553, 4555, 4618, 4698, 4806, 4807, 4821)

4402. Bouvrain, Georges. **Sur l'acceleration basifuge du developpement vasculaire dans l'Helianthus annuus (var. uniflorus). [The basifuge acceleration in the vascular development of H. annuus.]** Bull. Soc. Bot. France 71: 293–296. *Fig. 1–4.* 1924.—The author examined cross sections of the hypocotyl of very young *H. annuus* seedlings and found that, in the base of the hypocotyl, phloem cells were the only vascular elements developed. However, sections at the top of the hypocotyl showed a tracheal tube between the developing phloem bundles. This tube branches and runs out into the cotyledons, and is called an alternate vessel. Traces of this vessel disappear both above and below the cotyledons. This constitutes a fine example of basifuge development and belongs to the 1st stage of vascular evolution. According to the old view, the fundamentally different primary vessels from the stem and the root unite at some variable position in the hypocotyl by the insertion of a centripetal vessel coming from the root between 2 vessels from the stem. The phenomenon here described is a strong argument against this view. In sections of older plantlets, there are 3 tracheal vessels at the top of the hypocotyl and 1 at the base.—*P. A. Young.*

4403. Bugnon, P. **Sur les homologies de la feuille chez les Graminées. [The homologies of the leaf of Gramineae.]** Bull. Soc. Bot. France 71: 246–251. 1924.—The author believes that the limb of the vegetative grass leaf is equivalent to the base of the typical dicotyledonous leaf and that the grass leaf sheath is a new organ without equivalent in dicotyledonous leaves. Agnes Arber disagrees with this view, believing that this sheath is not a new formation but merely a transformation in the petiole. Details of these ideas of formation and transformation are given.—*P. A. Young.*

4404. Chauveaud, Gustave. **Sur les tentatives répétées d'altération de la phyllorhize. [The tentative repetition of the alteration of the phyllorhiza.]** Bull. Soc. Bot. France 71: 289–292. 1924.—The cell mass issuing from the egg of a cryptogam gives rise to a miniature plant which is the phyllorhiza. This consists of a green part directed upward ("phylle") and a whitish part directed downward, ("rhize"). The former includes, in its turn, a basal portion ("caule") which is limited towards the top by the initial mass; also a terminal portion ("feuille") situated above the said mass. The author replies to the criticisms of Bugnon, who, he says, has given a wrong impression of phyllorhiza. He states that cauloidy is a purely hypothetical condition. It does not explain the organization in *Psilotum triquetrum.* He says that the concept of the phyllorhiza should be substituted for the theory of cauloidy.—*P. A. Young.*

4405. Czaja, A. Th. **Zur Frage der habituellen Diozie bei Onoclea Struthiopteris Hoffm. [The question of the habitual dioeciousness of Onoclea Struthiopteris Hoffm.]** Ber. Deutsch. Bot Ges. 42: 300–304. 1924.—The author concludes that the gametophytes of all the homosporus ferns hitherto studied are, without exception, only facultatively dioecious.—*Hally Jolivette Sax.*

4406. Dahlgren, K. V. O. **Notes on the ab initio cellular Endosperm.** Bot. Notiser. 1923: 1–24. *Fig. 1–5.* 1923.—A list of families in which the cellular type of endosperm has been found, with citations and notes, is furnished. Study of the early stages of endosperm formation is difficult because of the action of killing agents on cells, and because of the presence of starch. Endosperm formation should be considered a factor of fundamental importance in establishing phylogenetic relationships. The presence of free nuclei in the Ericaceae needs confirmation. A few cases are known where plants having normal cellular endosperm occasionally develop a few free nuclei before cell formation begins. This occurs in the apogamic *Eupatorium glandulosum,* in *Hieracium aurantiacum,* and in *Antennaria alpina,* and is a secondary condition. The author discusses the peculiar endosperm formation in the Helobiae. "At the 1st division of the primary endosperm nucleus 2 cells are formed, a

smaller one situated above the antipodals, and a larger one occupying the remaining portion of the embryo sac. In the former, further nucleus and cell divisions may fail to appear; in the latter numerous free nuclei form which later may give rise to cells." The reported occurrences of the Helobiae-type of endosperm in other plants are discussed.—*H. K. Svenson.*

4407. Eberle, Georg. **Beitrag zur Kenntnis der Knollenbildung bei einigen Araceen. [Bulb formation in some Araceae.]** Ber. Deutsch. Bot. Ges. **41**: 114–120. 1923.

4408. Haberlandt, G. **Physiologische Pflanzenanatomie. [Physiological plant anatomy.]** *6 ed. 671 p. 295 fig.* Wilhem Engelmann: Leipzig, 1924.—This work has undergone many changes since its last edition. The arrangement has remained the same but there are many additions. At the end of each chapter the newer literature is reviewed and brought up to date.—*J. C. Th. Uphof.*

4409. Morvillez, F. **Appendicularisation progressive d'un ensemble de feuilles chez les plantes supérieures. [The progressive formation of appendages of a group of leaves in the higher plants.]** Comp. Rend. Soc. Biol. **91**: 305–306. 1924.—From a study of *Corylus avellana* L. it is concluded that the structure of the petiole is a function of the position of the leaf on the stem.—The leaf is only the part of a higher organic whole and here the 1st indication is obtained that the branches have undergone an evolution similar to that through which the leaves have passed.—*Oran Raber.*

4410. Nakano, H. **Untersuchungen über Kallusbildung und Wundheilung bei Keimpflanzen. I. [Researches on callus formation and wound healing in embryo plants.]** Ber. Deutsch. Bot. Ges. **42**: 261–267. *1 fig.* 1924.—This work treats of wound reactions in embryo plants of *Vicia faba*, *Pisum sativum*, *Phaseolus multiflorus*, *Soja hispida* and *Ricinis communis*. The author finds that the exposed end of a tracheid is closed by the 1st products of the procambium cells. If the callus is large the tracheids are covered by a thick layer of cutinized parenchyma cells. The development of callus in *Ricinus* showed some variations from that of *Vicia.*—*Hally Jolivette Sax.*

4411. Nakano, H. **Untersuchungen über Kallusbildung und Wundheilung bei Keimpflanzen. II. [Researches on callus formation and wound healing in embryo plants.]** Ber. Deutsch. Bot. Ges. **42**: 267–272. 1924.—The cotyledons of *Vicia*, *Pisum*, *Phaseolus*, *Soja* and *Ricinus* were cut in different directions. The results showed that the different wound surfaces showed variations in callus formation. A radial polarity with the cotyledon stem as a basal pole existed, and only those surfaces closely connected with this region developed callus profusely. The author believes that besides correlative influences there are 2 hormones which work together for a typical callus formation.—*Hally Jolivette Sax.*

4412. Neumayer, H. **Eine Methode zur Herstellung von Mikrotomschnitten mit (scheinbar) natürlicher Farbe der Chloroplasten. [A method of preparing microtome sections with (apparent) natural color of the chloroplasts.]** Ber. Deutsch. Bot. Ges. **40**: 41–43. 1922.—Fronds of *Angiopteris* fixed in hot concentrated potassium bichromate solution retained the green color of the chloroplasts after dehydrating, embedding and mounting in the usual manner.—*Karl Sax.*

4413. Pfeiffer, Hans. **Zur experimental Anatomie der Trennungsgewebe. [Experimental anatomy of cleavage tissue.]** Ber. Deutsch. Bot. Ges. **42**: 291–295. 1924.

4414. Philipp, M. **Über die verkorkten Abschlussgewebe der Monokotylen. [The corky protective tissues of monocotyledons.]** Bibliotheca Bot. **92**: 1–25. *Pl. 1.* 1924.—In the monocotyledons the protective tissues which reinforce the epidermis or supplant this outermost layer after rupture are of many types. The suberized cells constituting them are of various origins: primary cortical cells, secondarily suberized; periderm, of 2 types; and rhytidome, of several types. A protective layer of primary cells, secondarily suberized, is termed a "metacutis." In contrast, all other layers are wholly or partly secondary. The periderm rarely contains cells in long continuous radial rows, but in most cases is made up of "storied cork," in which the cells occur in short, irregularly placed, radial groups. Rhytidome is present in a large number of monocotyledons. This differs from the shell bark of the gymnosperms and dicotyledons in that a large part of its primary cells are metacutinized. Several types of rhytidome are distinguished, and lists of genera are given in which these and the other types of protective layers occur.—*A. J. Eames.*

4415. Rutgers, F. L. **I. Embryosac and embryo of Moringa oleifera Lam. II. The female gametophyte of Angiosperms.** *66 p. Pl. 1–6. 12 fig.* (Thesis, Univ. Utrecht) Leiden, 1923.—Part I. The archesporium is of 1 cell, forming 4 megaspores, the inner of which functions in production of a normal 4-nucleate stage. The 3rd division is limited to 1 of the micropylar nuclei, giving a 5-nucleate embryo-sac. The 1 male nucleus fuses with the egg, the other with the 2 chalazal nuclei to form the primary endosperm nucleus. Free nuclear division takes place at first in both the embryo and the endosperm.—Part II. An analytical summary of the manner in which the various types of embryo-sacs in Angiosperms may be formed and of the theoretical considerations involved. Classifications based on the number of divisions between embryo-sac, mother-cell and egg, or on number of nuclei in the full grown sac, are without phylogenetic value. Probably independent lines of development include: chromatin reduction, megaspore formation, polarization, development of a micropylar group of nuclei, and development of a chalazal group of nuclei. The 8-nucleate type of embryo-sac seems to be the original type, but no light is thrown on its method of origin. The 16-nucleate embryo-sac is considered to be derived from the complete development of 2 megaspores, and the 32-nucleate sac from 4 megaspores.—*Wm. Randolph Taylor.*

4416. Schiepp, Otto. **Konstruktionen zur Blattstellungstheorie.** [**Constructions for the leaf arrangement theory.**] Ber. Deutsch. Bot. Ges. **42**: 322–330. 1924.

4417. Schilling, Ernst. **Zur Morphologie, Physiologie und diagnostischen Bewertung der Bastfasern von Cannabis sativa.** [**The morphology, physiology and diagnostic value of the bast fibers of Cannabis sativa.**] Ber. Deutsch. Bot. Ges. **41**: 121–127. 1923.—The author finds that the bast fiber of *Cannabis sativa* responds to certain stimuli by means of locally limited surface growth. Both ends of the fiber are capable of reacting. The results of this growth may be seen in the irregular protuberances and branchings of the membrane. Artificial breaking of the stem or action of the wind call out this response. No healthy plants are free of these bast fibers with gable ends. They appear where there is the greatest mechanical strain.—*Hally Jolivette Sax.*

4418. Souèges, René. **Embryogênie des Euphorbiacées. Développement de l'embryon chez Euphorbia Esula L.** [**Embryogeny of the Euphorbiaceae. Development of the embryo in Euphorbia Esula.**] Compt. Rend. Acad. Sci. Paris **179**: 989–991. *Fig. 1–24.* 1924.—The development of the embryo of this species resembles that of the Ranunculaceae, especially *Myosurus minimus*. In both cases the elements of the tetrad are disposed in the same manner and have identical destinations. The differences lie in the development of the 2 basal elements of the tetrad and in the organization of the radicle.—*C. H. Farr.*

4419. Vuillemin, Paul. **Le phyllome et le frondome chez les Angiospermes.** [**The phyllome and the frondome in the angiosperms.**] Bull. Soc. Bot. France **71**: 117–119. 1924. —This is a discussion of the origin of leaves in plants. Vegetative leaves in plants arise in 2 ways: (1) as lateral appendages of the stem (buds) and (2) as branches of the stem. The leaves of angiosperms arise by the 1st method and are called by the author *phyllomes*. In contrast with this, the cotyledons, stamens, and pistils of angiosperms arise as branches of the stem, and are called *frondomes*. The leaves of *Lycopodium* also arise as branches of the stem. These terms also apply to venation, for, while dichotomous venation is common in cotyledons, it does not occur in true form in the ordinary angiosperm leaves in which lateral veins arise as branches and ramifications of other veins. In the evolutionary development of *Oenothera bistorta*, the cotyledons have become atrophied and partially supplanted by the 1st true leaves of the seedling.—*P. A. Young.*

4420. Zander, Robert. **Über bisher unbeachtet gebliebene Digestion drüsen von Drosera.** [**The hitherto unobserved digestive glands of Drosera.**] Ber. Deutsch. Bot. Ges. **42**: 251–255. *8 fig.* 1924.—While studying the flower stalks of *Drosera Spathulata* and *D. capensis* the author noted that numerous small Diptera were caught in nets of drops on these stalks. He studied these under the microscope and found that there were numerous protrusions consisting of a stalk with 2 basal cells and 2 cells above these and a cap of smaller cells regularly arranged. These are irregularly scattered and have no relation to the bundles. The secretion comes from the head cells only.—*Hally Jolivette Sax.*

MORPHOLOGY AND TAXONOMY OF ALGAE

E. N. Transeau, *Editor*
L. H. Tiffany, *Assistant Editor*

(See also in this issue Entries 4117, 4155, 4153, 4165, 4166, 4205, 4214, 4494, 4538, 4694, 4698, 4702, 4757, 4801, 4818)

4421. Bradler, E. **Die Froschlaichlage (Batrachospermum).** [The frog-spawn alga.] Micros. Naturf. **2**: 194–202. 1924.

4422. Heil, Hans. **Die Basalzelle des Tetrasporangiums von Dictyota dichotoma und einiges über die Zellwandstruktur.** [The basal cells of the tetrasporangium of Dictyota dichotoma and remarks on the cell wall structure.] Ber. Deutsch. Bot. Ges. **42**: 119–125. *Fig. 1–6.* 1924.—The tetrasporangium of *Dictyota dichotoma* possesses a columella-like basal cell with distinct mucus which protudes into the sporangium during spore formation and runs over the surface of the thallus after the spores have been discharged. This is a swelling mechanism which is active in the discharge of the spores. The cell-wall consists chiefly of pectin materials. The inner layers of the middle cells show strong cellulose reactions.—*Hally Jolivette Sax.*

4423. Hylander, C. J. **A preliminary report on the desmids of Connecticut.** Rhodora **24**: 213–224, 236–241. 1922.—This is a detailed catalogue of the desmids of the state, enumerating 266 species and varieties, 125 of them new to the state, 22 of them new to North America. The latter are *Netrium digitus* var. *constrictum* West & G. S. West, *Closterium Ceratium* Perty, *C. Jenneri* var. *robustum* G. S. West, *C. lunula* var. *coloratum* Kebs, *Euastrum binale* f. *Gutwinskii* Schmilde, *E. pictum* Borge, *E. pulchellum* Bréb., *Micrasterias americana* var. *Boldtii* Gutw., *M. papillifera* var. *glabra* Nordst., *Cosmarium Corbula* Bréb., *C. exiguum* var. *subrectangulum* West & G. S. West, *C. latifrons* Lund, *C. repandum* f. *minor* West & G. S. West, *C. subcucumis* Schmilde, *C. undulatum* var. *minutum* Wittr., *Xanthidium antilopaeum* var. *hebridarium* West & G. S. West, *X. subhastiferum* var. *Murrayi* West. & G. S. West, *Staurastrum aciculiferum* (Borge) West, *S. inflexum* Bréb., *S. polytrichum* Perty, *S. proboscideum* Arch., *Spondylosium pygmaeum* (Cooke) West.—*M. L. Fernald.*

4424. Linder, David H. **A new species of Rhizopogon from New Hampshire.** Rhodora **26**: 195–197. *Pl. 148.* 1924.—*Rhizopogon truncatus* n. sp. from New Hampshire is described and discussed.—*M. L. Fernald.*

4425. Lubimenko, V. **Sur la quantité de la chlorophylle chez les algues marines.** [On the quantity of chlorophyll in marine algae.] Compt. Rend. Acad. Sci. Paris **179**: 1073–1076. 1924.—It is found that the maximum quantity of chlorophyll which a plant may contain is fixed for the species. Specto-colorometric measurements are employed. The quantity of chlorophyll per kgm. of fresh weight and of dry weight is determined. If the quantity of chlorophyll per gm. of dry weight present in *Ailanthus* be taken as 100, then the amount in *Codium tomentosum* is 24. This is the largest relative amount found in any of the 7 algae studied. *Laurentia coronopus* had the least, 2.4. In general the Rhodophyceae have less than the Phaeophyceae or Chlorophyceae.—*C. H. Farr.*

4426. Pascher, A. **Über die morphologische Entwicklung der Flagellaten zu Algen.** [The morphological development of flagellates to algae.] Ber. Deutsch. Bot. Ges. **42**: 148–155. 1924.—The author is inclined toward the view that the algae developed from the flagellates because all series of flagellates connect with the algae, all transitions between flagellates and algae are formed, many algal swarm spores agree entirely with the flagellates and there is a series of characteristic spore forms in both. The cells as a rule divide across the long axis of the cell.—*Hally Jolivette Sax.*

4427. Petersen, J. B. **The freshwater Cyanophyceae of Iceland.** In: Kolderup-Rosenvinge, L., and E. Warming. **Botany of Iceland. Vol. 2.** *P. 249–324. 17 fig.* 1923. —The introduction indicates that 7 freshwater Cyanophyceae were included in Lauder Lindsay's compilation of the flora of Iceland. A work overlooked by him included Cyanophyceae determined by Liebmann, by which the following are reduced to synonymy: *Scytonema chthonoplastes* Liebm. = *S. mirabile* (Dillw.) Bornet, *Sphaerozyga Japeti* Liebm. and

S. thermarum Liebm. = *Hapalosiphon laminosus* (Cohn.) Hansg., *Oscillatoria elegans* = *Symploca muscorum* (Ag.) Gom. *Oscillatoria* sp? ("rufescens") = *Schizothrix calcicola* (Ag.) Gom.—Hariot (1893) listed 10 Cyanophyceae. G. S. West (1902) listed 16 species collected by A. W. Hill. The present paper includes 117 species, varieties and forms as having been observed by the writer. The material covered in this report was collected by various travelers, including the writer. Studies were made on the basis of preserved material, fluid and dried. Important use was made of the chlor-zinc-iodide reaction for distinguishing species according to the presence of cutin in the sheaths, and notes of colors according to the system of Klinkseick and Valette are given. An annotated list of the species observed is given with synonymy, locality and habitat data. The following are reported as new:—*Chroococcus Westii; Microcoleus Steenstrupii; Aphanocapsa Elachista* W. & G. S. West var. *irregularis; Chamaesiphon cylindricus; Phormidium ramosum; P. subcapitatum; Anabaena Poulseniana; A. Jonssoni; A. verrucosa; Tolypothrix tenuis* (Ktz.) J. Schmidt emend. f. *terrestris;* and *Fischerella muscicola* (Thur.) Gom. var. *minor*.—Special attention is accorded to thermal algae and to the following: *Gloeothece rupestris* Lyngb.) Bornet (including *Gloeocapsa tepidarium* A. Br. and *Gloeothece tepidarium* Lagerh.), *Chroococcus turgidus* (Ktz.) Naeg., *Aphanothece stagnina* (Spreng.) A. Br. (including *A. prasina* A. Br. and *Coccochloris stagnina* Spreng.), *Phormidium tenue* (Menegh.) Gom., *P. Treleasii* Gom., *Symploca muscorum* (Ag.) Gom., and *Anabaena flos-aquae* (Lyngb.) Breb. which forms water-bloom on a lake at Mývatn.—*Wm. Randolph Taylor.*

4428. Pevalek, I. **Prilog poznavanju epizojskih vrsta roda Characium. [Contribution to the knowledge of epizoic species of the genus Characium.]** (With German summary.) Glasnik Hrvatskog Prirodoslovnoga Društva [Zagreb] **35**: 115–117. *2 fig.* 1924.—*Characium Lamberti* n. sp. has 3 forms: var. *gracilipes* (Lamb.) Pevalek (*C. gracilipes* Lambert) known from America; var. *intermedia* n. var. from Zagreb; and var. *setosa* (Filarszky) Pevalek (*C. setosum* Filarszky) from Czechoslovakia. *Characium saccatum* Filarszky var. *major*. n. var. also occurs in the vicinity of Zagreb.—*I. Pevalek.*

4429. Sauvageau, C. **Sur le curieux développement d'une Algue phéosporée, Castagnea Zosterae Thuret. [The curious development of a pheosporic alga, Castagnea Zosterae Thuret.]** Compt. Rend. Acad. Sci. Paris **179**: 1381–1383. *Fig. A–F.* 1924.—This alga grows on the leaves of *Zostera marina.* The zoospores settle down as embryospores. Some of them form discs like *Coleochaete;* others form filaments resembling *Streblonema,* which produce plurilocular sporangia. The zoospores from these likewise produce either discs of filaments, or intermediate structures.—*C. H. Farr.*

4430. Schmidt, O. C. **Beitrage zur Kenntnis der Gattung Codium Stackh. [Contributions to our knowledge of the genus Codium.]** Bibliotheca Bot. **91**: 1–67. *Fig. 1–44.* 1923.—This monograph of the genus *Codium* consists of 2 parts. In the general part the author discusses the morphology and anatomy of the thallus, sexual reproduction, asexual reproduction, development, systematic position, relationships of the species and the geographical distribution of this genus of marine algae. The special part contains a key to and descriptions of the 32 species recognized in the world. *Codium acuminatum* and *C. Pilgeri* are described as new species. *C. geppii* is proposed as a new combination for *C. divaricatum* Gepp.—*W. C. Muenscher.*

4431. Setchell, William Albert. **Dumontia filiformis on the New England coast.** Rhodora **25**: 33–37. 1923.—*Dumontia filiformis* (Huds.) Grev., long sought for, has in the last decade been found at stations on the Maine coast, where its sudden appearance in abundance has suggested recent introduction. The author now finds it in shallow tidal-pools at Newport, Rhode Island, where it is overmature and becoming disorganized by July. He believed it a species of long residence on the New England coast, readily overlooked in its July condition, when it resembles *Halosaccion ramentaceum* (L.) Ag. Further study may show the New England plant to differ in some points from the European, likewise from the plant of the North Pacific which passes as *D. filiformis.—M. L. Fernald.*

4432. Setchell, William Albert, and Nathaniel Lyon Gardner. **Phycological contributions. VII.** Univ. California Publ. Bot. **13**: 1–13. 1924.—Contribution No. VII is restricted to the Brown Algae, of which there are proposed the following new genera: **Men-**

eghiniella, Heterochordaria, and Phaeostrophion; the following new species: *Sphacelaria subfusca, Ectocarpus Parksii, Ralfsia californica, R. hesperia, Leathesia nana, L. amplissima, Punctaria hesperia, P. fissilis, P. occidentalis, P. chartacea, P. expansa, Meneghiniella Brandegeei, Desmarestia pacifica, D. farcta, D. munda, D. media* var. *tenuis, Chordaria gracilis, C. disessa, Coilodesme corrugata, C. polygnampta, C. rigida, C. sitchensis, Phaeostrophion irregulare, Dictyosiphon tenuis, Laminaria personata,* and *Clanidophora abyssicola, Zonaria Farlowii;* and the following new names or combinations: *Meneghiniella Posidoniae* (Menegh.), *M. zostericola* (J. Ag.), *M. erythraea* (J. Ag.), *Heterochordaria abietina* (Rupr.), *Ralfsia fungiformis* (Gunn.), *Aegira virescens* (Carm.), *Microspongium Saundersii, Petrospongium rugosum* (Okamura), *Gobia simplex* (Saunders), *Dictyota flabellata* (Collins), *Punctaria lobata* (Saunders), *Myriogloia callitricha* (Rosenv.), *Myriogloia capensis* (J. G. Ag.), *Ilea Fascia* f. *typica, I. Fascia* f. *debilis* (Ag.), *I. Fascia* f. *caespitosa* (J. Ag.), *I. Fascia* f. *zosterifolia* (Reinke), and *I. Fascia* f. *filiformis* (Batters).—*W. A. Setchell.*

4433. Wille, N. **Süsswasseralgen von der Deutschen Südpolar Expedition auf dem Schiff "Gauss."** [**Freshwater algae from the German South Polar Expedition of the "Gauss."**] Deutsche Südpolar-Expedition 1901–1903 **8**: 374–445. *Pl. 27–30, fig. 1 and A–C.* 1924.—An outline of the contributions of previous expeditions to the known freshwater algal flora is given, with lists of species found. The present expedition collected on the "Gaussberg," 66° 47′ 48″ S. L. The flora proved sparse, probably due to the igneous nature of the rocks. A few forms are listed, including the new *Chroococcus minutus* (Kütz.) Nägl. var. *amethystacea* and *Pleurococcus tectorum* Trevis f. *antarctica.*—A systematic list with localities and collector is given for all freshwater algae reported from the Antarctic, including as new: *Chroococcus cohaerens* (Bréb.) Nägl. var. *antarctica, Phormidium glaciale* W. and G. S. West f. *longis articulata; Chlorococcum infusionum* Menegh. f. *antarctica; Chlorella Koettlitzi* (Fritsch) n. comb.; *Prasiola fluviatilis* (Sommerf.) Aresch. f. *antarctica,* special notes being given to the Nostocs.—The 2nd section of the paper deals with the freshwater algae collected by the expedition on the Kerguelen Islands. The following are given as new: *Aphanothece prasina* A. Br. f. *minor; Chroococcus kerguelensis; Chroococcus turgidus* (Kütz.) Nägl. f. *minor; Microcystis kerguelensis; Synechococcus elongatus* Nägl. f. *minor; S. kerguelensis; Schizothrix kerguelensis; Aulosira implexa* Born. & Flahault f. *kerguelensis; A. minor;* **Vanhöffenia** n. gen. (Glaucophyceae); *V. antarctica; Closterium juncidum* Ralfs f. *minor; C. parvulum* Nägl. f. *minor; Cosmarium contractum* Kirchn. f. *minor; C. exiguum* Arch. var. *subrectangulum* G. S. West f. *minor; C. Gayanum* DeToni f. *kerguelensis; Chlorosphaera kerguelensis; Codiolum gregarium* A. Br. f. *antarctica; Chlorella tetraedrica; C. Werthii; Tetraedron caudatum* (Corda) Hansg. f. *minor; T. punctulatum* (Reinsch.) Hansg. f. *trigona; Pediastrum Boryanum* (Turp.) Menegh. var. *campanulatum; P. Boryanum* (Turp.) Menegh. var. *depauperata;* **Soropediastrum** n. gen., Hydrodictyaceae; *S. kerguelensis; S. rotundatum; Crucigenia antarctica; Scenedesmus hystrix* Lagerh. f. *laevis; S. kerguelensis; S. pediastroides.*—An appendix lists species collected at Possession Island, New Amsterdam, Cape Colony, and Sete Cidades.—*Wm. Randolph Taylor.*

4434. Wislouch, Stanislaw. **Przyczynek do biologji solnisk i genezy szlamów leczniczych na Krymie.** [**Notes on the biology and formation of the ooze of the salt beds of the Crimea.**] (German resume) Acta Soc. Bot. Poloniae **2**: 99–129. *Pl. 3.* 1924.—The author lists 16 bacteria, 20 Myxophyceae, 3 Chrysomonads, 2 Cryptomonads, 2 Euglenaceae, 6 Volvocaceae, 3 Peridineae, 18 diatoms and 3 Chlorophyceae, of which *Chroococcus sarcinoides, Synechocystis salina, Spirulina tenuissima* Ktz. var. *salina, Cryptomonas stigmatica, C. salina, Raciborskiella salina, Carteria salina, Exuviella asymmetrica* are described as new, Wislouch being the authority.—*C. W. Dodge.*

4435. Wislouch, S. M. **Beiträge zur Diatomeenflora von Asien. II. Neuere Untersuchungen über die Diatomeen des Baikal-sees.** [**Contributions to the diatom flora of Asia. II. New researches on the diatoms of Lake Baikal.**] Ber. Deutsch. Bot. Ges. **42**: 163–173. *1 fig.* 1924.—(See also Ibid. 41. 325–331, 1923.)

4436. Woloszyńska, Jadwiga. **Javanische Süsswasserperidineen.** [**Javan freshwater Peridineae.**] Acta Soc. Bot. Poloniae **1**: 263–266. *Pl. 6.* 1923 [1924].—The author describes and figures 4 species of *Peridinium,* of which *P. Wildemani* is described (in German) as new.—*C. W. Dodge.*

MORPHOLOGY AND TAXONOMY OF BRYOPHYTES

ALEXANDER W. EVANS, *Editor*

(See also in this issue Entries 4175, 4198, 4698, 4726)

4437. BROTHERUS, V. F. [Musci. II. Unterklasse Andreaeales.] Andreaeaceae. ENGLER, A., UND K. PRANTL. Die Natürlichen Pflanzenfamilien *2nd ed.* Vol. 10. *P. 129–131. Fig. 108–109.* 1924.—In the 1st edition *Andreaea* was the only genus of the Andreaeales recognized by the author. In his present treatment, in addition to *Andreaea* (with 122 species), he recognizes *Neuroloma* Card. (1911), a monotypic genus based on a Fuegian species. The Andreaeales are almost cosmopolitan in their distributions but are confined to high mountains in tropical regions. [See also this issue, Entries 4438, 4457, 4459, 4460, 4461, 4462.]—*A. W. Evans.*

4438. BROTHERUS, V. F. [Musci. III. Unterklasse Bryales.] II. Spezieller Teil. [Special part.] ENGLER, A., UND K. PRANTL. Die Natürlichen Pflanzenfamilien. *2nd. ed.* Vol. 10. *P. 143–478. Fig. 116–420.* 1924.—The section on the taxonomy of the Bryales, which the author contributed to the 1st edition, has been thoroughly revised. He now adopts with certain modifications, the classification recently proposed by Fleischer in the 4th volume of his Musci der Flora von Buitenzorg (see Bot. Absts. 13, Entry 6643). The present volume takes up 8 orders (Reihen) of the Eubryinales, as follows: Fissidentales, with the family Fissidentaceae (4 genera); Dicranales, with the families Archidiaceae (1 genus), Ditrichaceae (17 genera), Bryoxiphiaceae (1 genus), Seligeriaceae (6 genera), Dicranaceae (48 genera), Dicnemonaceae (4 genera), Pleurophascaceae (1 genus), and Leucobryaceae (9 genera); Pottiales, with the families Calymperaceae (5 genera), Encalyptaceae (1 genus), and Pottiaceae (71 genera); Grimmiales, with the family Grimmiaceae (6 genera); Funariales, with the families Gigaspermaecae (4 genera), Disceliaceae (1 genus), Ephemeraceae (3 genera), Funariaceae (9 genera), Oedopodiaceae (1 genus), and Splachnaceae (8 genera); Schistostegiales, with the family Schistostegaceae (1 genus); Tetraphidales, with the family Georgiaceae (2 genera); and Eubryales, with the families Bryaceae (17 genera), Leptostomaceae (1 genus), Mniaceae (7 genera), Drepanophyllaceae (2 genera), Eustichiaceae (1 genus), Sorapillaceae (1 genus), Mitteniaceae (1 genus), Calomniaceae (1 genus), Rhizogoniaceae (7 genera), Hypnodendraceae (4 genera), Aulacomniaceae (2 genera), Meeseaceae (3 genera), Catoscopiaceae (1 genus), Bartramiaceae (9 genera), Spiridentaceae (2 genera), and Timmiaceae (1 genus). A number of genera, not included in the 1st edition, are here recognized. A few of these represent subgenera or sections raised to generic rank, but the majority are based on recent investigations. A list of these genera, with dates of publication, follows, the number of species in each being given in parentheses and those proposed as new being designated by heavy type: *Aloinella* Card. (4), 1909; *Anisothecium* Mitt. (35), 1869; *Anomobryopsis* Card. (1), 1911; *Arctoa* Bryol. Eur. (2), 1846; *Barnesia* Card. (1), 1910; *Beddomiella* Dix. (1), 1922; *Brotherobryum* Fleisch. (2), 1914; *Bryobrothera* Thér. (1), 1921; **Bryomnium** Card. (1); *Calymperopsis* (C. Müll.) Fleisch. (11), 1913; *Chamaebryum* Thér. & Dix. (4), 1922; *Chionoloma* Dix. (1), 1922; **Chorisodontium** (Mitt.) Broth. (11), based on *Dicranum* sect. *Chorisodontium* Mitt.; *Cnestrum* Hag. (1), 1914; *Costesia* Thér. (1), 1917; *Dactylhymenium* Card. (1), 1909; *Dicnemoloma* Ren. (12), 1901; *Erythrophyllopsis* Broth, (1), 1916; **Eucamptodontopsis** Broth. (1); *Fissidentella* Card. (1), 1909; *Franciella* Thér. (1),1909; *Gertrudia* Herz. (1), 1916; **Holodontium** Broth. (5); *Husnotiella* Card. (3), 1909; *Hygrodicranum* Card. (2), 1911; *Hymenodontopsis* Herz. (2), 1916; *Hymenoloma* Dus. (3), 1905; *Hyophilopsis* Card. & Dix. (1), 1911; *Hypodontium* C. Müll. (2), 1899; *Kiaeria* Hag. (5), 1914; *Kleioweisiopsis* Dix. (1), 1920; *Leptodontiopsis* Broth. (2), 1911; *Microcampylopus* C. Müll. (2), 1899; *Microdus* Schimp. (41), 1871; *Morinia* Card. (1), 1910; *Moseniella* Broth. (1), 1917; *Oedopodiella* Dix. (1), 1922; *Orthodicranum* Loeske (5), 1910; *Paraleucobryum* (Lindb.) Loeske (3), 1908; *Philibertiella* Card. (1), 1914; *Physcomitrellopsis* Broth. & Wag. (1), 1922; **Platyneurum** (Card.) Broth. (1), based on *Dicranum* subg. *Platyneurum* Card.; *Polymerdon* Herz. (1), 1909; *Pringleella* Card. (2), 1909; *Pseudocrossidium* Williams (5), 1915; *Pseudoephemerum* (Lindb.) Hag. (3), 1910; *Pseudopohlia* Williams (2), 1914; **Pseudosymblepharis** Broth. (3); *Rhabdoweisiella* Williams

(1), 1914; *Rhexophyllum* Herz. (1), 1916; *Simplicidens* Herz. (2), 1909; *Sporeledera* Hampe (8), 1837; *Stegonia* Vent. (2), 1883; *Streptotrichum* Herz. (1), 1916; *Synthetodontium* Card. (1), 1919; Tetrapterum Hampe (11); *Thyridium* Mitt. (33), 1868; *Thysanomitrium* Schwaegr. (31), 1823; Trachycarpidium Broth. (1); *Trichostomopsis* Card. (1), 1909; *Türckheimia* Broth. (3), 1910; and *Weisiopsis* Broth. (7), 1920. The genus *Tristichiopsis* C. Müll., on the other hand, although recognized in the 1st edition, is here included under *Tristichium* C. Müll. *Bryomnium solitarium* Card. of the Congo is described as new, and a large number of new combinations are made. The illustrations are largely reproduced from the 1st edition, but a few new ones are added. [See also this issue, Entries 4437, 4457, 4459, 4460, 4461, 4462.]—*A. W. Evans.*

4439. Buch, Hans. **Physiologische und experimentell morphologische Studien an beblätterten Lebermoosen. I und II.** [**Physiological and experimental morphological studies on leafy liverworts.**] Öfversigt Finska Vetensk.- Soc. Förhandl. **62A**[6]: 1–46. *Pl. 1, 2.* 1920.—In the 1st part of the present paper the author considers the germination of the leafy liverworts. He uses the term "germination" in a broad sense so as to include the formation of protonema from any isolated parts of the plant, as well as from spores or brood-bodies. In the case of *Sphenolobus Michauxii* he shows that the gemmae do not germinate normally until several months after separation but that the process can be hastened by adding iron ammonium tartrate to the culture medium. The spores of the same species will not germinate at all in distilled water. He then discusses the localization of the germinating power to certain parts of separated leaves and shows (among other things) that the direction of the nutrient stream is apparently without significance.—In the 2nd part he considers the conditions necessary for the development of leafy shoots on the protonema, especially in *Sphenolobus Michauxii*. He shows that organic nitrogenous compounds, such as asparagin, peptone or ammonium tartrate, produce a more copious shoot development than potassium tartrate, but that the addition of dextrose is without effect. He shows further that a reduction in the concentration of the nitrogenous compounds present forces leafy shoots to revert to a protonemal condition.—*R. Collander.*

4440. Campbell, D. H. **A remarkable development of the sporophyte in Anthoceros fusiformis. Aust.** Ann. Bot. **38**: 473–483. *Fig. 1–8.* 1924.—Specimens of *Anthoceros fusiformis*, growing in the San Jose Canyon, near Carmel, California, were found to have much better developed sporophytes than usual (see also Bot. Absts. 13, Entry 2653). These, in some cases, were quite 6 inches long and noticeably bulky, with a hypertrophied base up to 1 mm. in diameter. The diameter of the columella was nearly twice that of normal sporophytes, and in longitudinal sections it appeared as a stout strand of elongated cells suggestive of a simple vascular bundle. There was a reduction in size or complete disappearance of the lacuna surrounding the columella, with a corresponding increase in the amount of green tissue. The foot also was much enlarged and in some cases almost completely exposed below, probably having been capable of absorbing water without the intervention of gametophytic tissue. These plants are compared in detail with *Rhynia* and *Hornea*, described by Kidston and Lang from the Lower Devonian of Scotland. It is concluded that the Anthocerotales or closely related forms have given rise to the Rhyniaceae and through them to the Pteridophytes in general.—*W. P. Thompson.*

4441. Dismier, G. **Contribution à la flore bryologique de la Drôme: le Diois.** [**Bryophyte flora of the Drôme: the Diois.**] Bull. Soc. Bot. France **69**: 690–700. 1922.—This 2nd paper on the bryophytes of the Drôme, France, supplements an earlier study on the species found in southern Valentinois (see Bot. Absts, 12, Entry 6484). The region around Die, the author's headquarters in the summer of 1921, belongs geologically to the Jurassic limestone and calcifugous species are wholly absent. Forests are rare, bogs are lacking, and most of the brooks dry up in the summer. In spite of these unfavorable conditions 220 species were collected, 76 of the mosses and 20 of the hepatics being new to the Drôme and raising the total number of bryophytes known from the region to 297. The more interesting species and varieties, 22 mosses and 2 hepatics, are listed separately with data regarding stations and, in some cases, with critical remarks.—*A. W. Evans.*

4442. Dixon, H. N. **Fleischer's Mosses of Java.** [Rev. of: Fleischer, Max. **Die**

Musci der Flora von Buitenzorg, zugleich Laubmoosflora von Java, mit Berücksichtigung aller Familien und Gattungen der gesammten Laubmooswelt. (Mosses of the Buitenzorg flora, likewise moss flora of Java, with a consideration of the families and genera of the entire moss world.) Vol. 4. *i–xxxi + 1105–1727 p. Fig. 185–256.* E. J. Brill: Leiden, 1915–1923 (see Bot. Absts. 13, Entry 6643).] Bryologist 27: 80–83. 1924.—The reviewer deplores the numerous misprints, not all of which are corrected in the "corrigenda," and instances a few of the latter cases; he commends the work for its important bearing upon the bryology of the Indo-Malayan region, and for its significance as the starting point of a new taxonomic system for the Bryales. This system is briefly outlined, the reviewer indicating points in which he feels that not all students will concur with the author. His interpretation of the relationships of *Eurhynchium rusciforme* Milde and his disposition of the genus *Isopterygium* are particularly criticised. The reviewer emphasizes the need for a careful study of Fleischer's proposals, based on a wide knowledge of universal bryology, but suggests that all change may not be progress.—*E. B. Chamberlain.*

4443. Evans, Alexander W. **Notes on New England Hepaticae,—XVII.** Rhodora 25: 74–83, 89–98. 1923.—*Ricciella* A. Br. is reduced to *Riccia* L. and *Neesiella* Schiffn. to *Grimaldia* Raddi. *Fossombronia salina* Lindb. is found to be conspecific with *F. brasiliensis* Steph., and a tolerably continuous range is established from southern New England to Brazil. *Bazzania tricrenata* (Wahlenb.) Trevis, is found to be confined in America to the mountains from Newfoundland to northern New England, the plant of lower levels and wider range being *B. denudata* (Torr.) Trevis. The characters of the 2 are discussed in detail. *Scapania nemorosa* (L.) Dumort. and its segregates, *S. Joergensenii* Schiffn., *S. Austinii* Warnst. and *S. recurvifolia* Warnst., are studied in detail and found to be phases of a single species, *S. nemorosa.* The Connecticut plant reported by Warnstorf as *S. spitzbergensis* (Lindb.) K. Müll. is found to belong also to *S. nemorosa, S. spitzbergensis* being known as an American plant only in Greenland. *Lejeunea patens* Lindb., new to New England, is reported from Mt. Desert Island; and additions are made to records for the individual New England states. The total number of species now known from New England is 196; from Maine, 151; New Hampshire, 154; Vermont, 137; Massachusetts 121; Rhode Island, 81; Connecticut, 146; from all six states, 66.—*M. L. Fernald.*

4444. Evans, Alexander W. **Second revised list of New England Hepaticae.** Rhodora 25: 192–199. 1923.—This is a check list brought to date, showing occurrence of the species in each state. In the earlier list (1903) 123 species were credited to New England; 75 of them to Maine, 81 to New Hampshire, 67 to Vermont, 76 to Masachusetts, 65 to Rhode Island and 94 to Connecticut. The activity during the intervening 20 years is indicated by the record at the end of 1923: 196 species are now known in New England; 151 of them from Maine, 154 from New Hampshire, 137 from Vermont, 121 from Massachusetts, 82 from Rhode Island and 147 from Connecticut.—*M. L. Fernald.*

4445. Herzog, Th. **Die Moose der Verlandungsformation der hochandinen Glazialseen. [Mosses associated with the transition from glacial lakes to dry ground in the high Andes.]** Bot. Jahrb. 59 (Beiblatt 131): 14–18. 1924.—The lakes studied were in the Bolivian Andes at an altitude of 4000–5000 m. These lakes are very numerous and are all in the process of transformation into land. Mosses instead of phanerogams are dominant. Some of the more important mosses are mentioned, and their relation to the mollusks and other animal life, and thus indirectly to the food of birds, is discussed. On the lake border a zone of *Distichium* cushions takes the place of our *Sphagnum* "Hochmoore." No *Sphagnum* is found around these lakes, it being confined to the forest zone below. The author, after extended discussion, concludes that the absence of *Sphagnum* is more likely due to the dry atmosphere than to a lack of water in the substratum or any other factor. The affinities of the mosses taking part in the land formation are discussed.—*K. M. Wiegand.*

4446. Ikoma, Y. **Aquatic bryophytes from San' in.** (Japanese.) Bot. Mag. Tokyo 35: (162)–(163). 1921.—The following species are briefly discussed: *Thamnium planifrons* Broth. & Yasuda n. sp., *Oxyrrhynchium Sasaokae* Sh. Okam., and *Stereodon revolutum* Mitt.—*Frederick V. Rand.*

4447. Killian, Charles. **Cultures d'hépatiques. [Cultures of Hepaticae.]** Compt.

Rend. Soc. Biol. 91: 277–280. *6 fig.* 1924.—A mixed organic and mineral medium is particularly favorable to the development of certain lignicole species, such as *Lophocolea bidentata* and *Nowellia curvifolia.* These artificial media, however, do not always work; no success has yet been attained with *Pellia epiphylla.* It is suggested that this form may be dependent upon some symbiotic fungus, and further experiments are being carried out to test this hypothesis.—*Oran Raber.*

4448. Lamothe, Aimé. **Recherches anatomiques et taxinomiques sur le gamétophyte des Marchantiales.** [**Anatomical and taxonomic researches on the gametophyte of the Marchantiales.**] Thesis. *8 vo. 179 p. Pl. 1–5, 26 fig.* A. Rey: Lyon, 1919.—The present work is based on the anatomical study of the gametophyte in 80 species and varieties of the Marchantiales. It is divided into 2 parts. The opening chapter of the 1st part reviews the work done by earlier students in this field and shows how anatomical characters have been utilized in the classification of the group. In the 2nd chapter the author discusses the various types of anatomical structures found in the Marchantiales and lays especial emphasis on the following, from the standpoint of taxonomy: upper epidermis, epidermal pores (or pseudostomata), air chambers, parenchyma without intercellular spaces, lower epidermis ventral scales, and rhizoids. In the 3rd chapter he lists the features which he finds to be constant in individual species and designates those drawn from the epidermal pores as the most important. As examples of such constant features it will be sufficient to cite the following, drawn from pores with 2 ostioles: the form of the internal ostiole, the number of superimposed rings of cells surrounding the pore-canal, the number of rings corresponding with the epidermis, the number of rings above and below the epidermis (respectively), the number of cells in the rings bounding the 2 ostioles, and the number of cells in the other rings. In the 4th chapter he makes the following contributions to the classification of the Marchantiales: the proposal of the new sub-family Tesselinoïdées (on the basis of anatomical characters), for the reception of the genus *Tesselina;* the proof of strong anatomical similarity between *Hypenantron pilosum* Tayl. and the genus *Plagiochasma;* the transference of *Reboulia maderensis* Raddi to *Plagiochasma;* the reduction of *Marchantia Berteroana* L. & L. to a variety of *M. polymorpha* L.; and the proposal of *Chomiocarpon Chiffloti* as a new species. In the 5th chapter he describes the development of epidermal pores and air-chambers and comments on the presence of sclerotic cells in certain species. In the 6th chapter he presents a geneology of the Marchantiales based on morphological and anatomical features. In the 2nd part of the work (divided into 2 chapters) he gives a detailed account of the anatomy of the various forms studied and supplies a key for the determination of these forms by means of anatomical characters alone. A bibliography of 50 titles concludes the paper.—*A. W. Evans.*

4449. Lorenz, Annie. **A revision of the Mt. Desert hepatic list.** Rhodora 26: 6–13. 1924.—The original list published in Rand & Redfield's Mt. Desert Flora contained 49 species; the present list contains 97. Two species when found were new to New England: *Diplophyllum albicans* (L.) Dumort. and *Lejeunea patens* Lindb.; while 6 others were new to Maine: *Lunularia cruciata* (l.) Dumort., *Calypogeia fissa* (L.) Raddi, *C. sphagnicola* (Arn. & Perss.) Warnst. & Loeska, *C. Sullivantii* Aust., *Scapania paludosa* K. Müll. and *Radula obconica* Sull. The local stations are enumerated under each species.—*M. L. Fernald.*

4450. Malta, N. **Studien über die Laubmoosgattung Zygodon Hook. et Tayl. (1–4).** [**Studies on the moss genus Zygodon.**] Latvijas Augstskolas Raksti [Acta Univ. Latviensis] 5: 187–192. *Fig. 1–3.* 1923.—The 1st study of this series, dealing with the distribution of *Zygodon conoideus* (Dicks.) Hook. et Tayl., has been abstracted (see Bot. Absts. 11, Entry 2671). In the 2nd study vegetative reproduction by means of deciduous leaves (Bruchblätter) is discussed. This process is much less widespread in Zygodon than vegetative reproduction by means of gemmae but has been demonstrated by the author in the following species: *Z. affinis* Rehm. of the Transvaal, *Z. barbuloides* Broth. and *Z. fragilifolius* Broth. of the Kilimanjaro region, and *Z. campylophyllus* C. Müll. of Mexico. In *Z. affinis,* the only case described in detail, both gemmae and deciduous leaves are produced, the deciduous habit involving most of the leaves on old plants. The line of separation lies in the middle lamellae; the young protonemata (springing mostly from the midrib) form both rhizoids and gemmae.—In the 3rd study *Z. corralensis* Lorentz of Chile is taken up, and a close re-

lationship with *Z. Forsteri* (Dicks.) Mitt. and *Z. Menziesii* (Schwaegr.) W.-Arn. is established. For these 3 species a new section is proposed under the name *Bryoides*. It is further pointed out that the true *Z. corralensis* has been much confused in the literature with *Z. rufulus* Dusén, a member of another section.—In the 4th study it is shown that *Z. Sullivantii* C. Müll., of the Alleghany Mountains of North America, is probably a species of *Leptodontium* and that it should bear the name *L. excelsus* (Sull.) E. G. Britton.—*A. W. Evans.*

4451. Malta, N. **Studien über die Laubmoostattung Zygodon Hook. et Tayl. (5–9).** [Studies on the moss genus Zygodon.] Latvijas Augstskolas Raksti [Acta Univ. Latviensis] **6**: 273–285. *Fig. 1–5.* 1923.—In the 5th study of this series (see preceding entry) the structure of the peristome is discussed. In some cases a double peristome is present, in others a single peristome, and in still others no peristome at all. A single species, however, may show 2 of these conditions, so that a system of classification for the species can not be safely based on differences in the peristome.—The 6th study investigates the floral conditions in certain polygamous species of Zygodon, such as *Z. Reinwardtii* (Hornsch.) A. Br. Three types of inflorescence are distinguished: male inflorescences (with an occasional unfertilized archegonium), female inflorescences (with abortive antheridia or none at all), and bisexual inflorescences (with functional antheridia and archegonia in approximately equal numbers). The author denies that a dichogamy is present (as suggested by Warnstorf in the case of *Bryum intermedium*) but thinks that these polygamous species may represent a transition between a synoicous and an autoicous condition.—In the 7th study it is shown that certain species of Leptodontium, described from sterile material, have been incorrectly referred to *Zygodon*, on account of their very similar gemmae. These species can be distinguished by the presence of guide-cells in the midribs of the leaves. In addition to the North American *Z. Sullivantii* C. Müll., which had previously been considered, the following species belong to this category: *Z. filiformis* Lorentz of Ecuador, which is probably a synonym of *Leptodontium flexifolium* (Dicks.) Hampe; *Z. orthotrichoides* Broth. of Bolivia; and *Z. Simii* Dixon of Natal, which may be the same as *L. squarrosum* (Hook.) Par.—In the 8th study new stations for *Z. conoideus* (Dicks.) Hook. & Tayl. (see Bot. Absts. 11, Entry 2671) are given, the species being reported for the 1st time from Finland.—In the 9th study a division of the genus into the following 4 sections is proposed: *Bryoides* Malta (with about 10 species), *Obtusifolia* Malta n. sect. (with perhaps 3 species), *Euzygodon* C. Müll. (with about 100 species), and *Stenomitrium* Mitt. (with 2 species). They are based on characters drawn from the leaf-cells, the leaf-form, and the leaf-arrangement.—*A. W. Evans.*

4452. Malta, N. **Über die Lebensdauer der Laubmoosporen.** [The longevity of moss spores.] Latvijas Augstskolas Raksti [Acta Univ. Latviensis] **4**: 235–246. 1922.—The author presents the results of his germination experiments with moss spores of various ages. These were carried out with about 200 species belong to 80 genera. It was found that the power to germinate diminished rapidly with the age of the spores. With spores 2 years old, for example, 90% germinated; with spores 3 years old, 67%; with spores 4 years old, 43%; with spores 5 years old, 41%; with spores 6 years old, 24%; and with spores 7 years old, only 16%. The oldest spores to germinate were those of *Ceratodon purpureus*, 16 years old; the next oldest those of *Funaria hygrometrica*, 13 years old. It was found further that the spores of acrocarpous mosses, as a rule, retained the power to germinate much longer than those of pleurocarpous mosses. The oldest spores of the latter group yielding positive results were those of *Fabronia pusilla*, 6 years old, while those of *Brachythecium salebrosum* only 1 month old failed to germinate in 30% of the experiments. Spores of liverworts and peat mosses from 4 to 9 years old failed to germinate in all cases. The author notes his inability to confirm his earlier positive results with the spores of *Grimmia pulvinata*, 70 years old (see Bot. Absts. 11, Entry 2670), and suspects that an admixture must have been present.—*A. W. Evans.*

4453. Мейер, К. И. [Meyer, K. I.] **История развития спорогония у Pellia epipylla Dill. Материалы для познания спорофита Jungermanniales. II.** [Development of the sporogonium of Pellia epiphylla Dill. Contributions to our knowledge of the sporophyte on the Jungermanniales. II.] Журнал Русского Ботанического Общества. [Jour. Russian Bot. Soc. **5**: 8–15. *Pl. 2.* 1920.—The development of the sporogonium in *Pellia epiphylla* is

much the same as in *Radula complanata* but differs in certain particulars. The hypobasal cell, for example, although forming an appendage to the foot and remaining undivided for a while, eventually undergoes a few divisions. In the epibasal cell, however, 2 vertical walls at right angles precede the 1st horizontal wall. In the later stages growth is most active in the upper part of the young sporophyte, and the sporogenous tissue is augmented by cells from the amphithecium. The characteristic elaterophore develops at the expense of the sporogenous tissue, and the spore mother cells (as in the *Radula*) assume a quadrilobar form preparatory to the reducing division. This abstract was prepared from a French resumé accompanying the paper.—*A. W. Evans.*

4454. Мейер, К. И. [Meyer, K. I.] **К истории развития спорогония у Catharinea undulata (L.) Web. Mohr.** [**Development of the sporogonium of Catharinea undulata (L.) Web. Mohr.**] Журнал Русского Ботанического Общества [Jour. Russian Bot. Soc.] **7**: 101–110. *Fig. 1–25.* 1922.—The hypobasal cell, as in *Pellia* (see preceding entry), undergoes a few divisions and forms an appendage to the foot. The epibasal cell divides by a horizontal wall and in the upper cell thus formed 2 oblique walls cut off an apical cell with 2 cutting faces. This gives rise to 2 series of segments, which divide by means of vertical and horizontal walls. The lower part of the sporophyte develops into the foot, which absorbs the nutritive contents of the adjacent archegonial cells. The growth of the sporophyte is mainly by means of an intercalary meristem at some distance from the apex. This gives rise not only to the seta but also to the greater part of the capsule. The sporogenous tissue, at first forming a single layer of cells soon becomes several cells thick and produces slightly 4-lobed mother-cells, the reducing division taking place earlier than in the Jungermanniales. The peristome develops relatively late from meristematic tissue above the sporogenous tissue; the cells of this tissue form longitudinal rows, the middle cells of which become horseshoe-shaped and give rise to the teeth of the peristome. This abstract was prepared from a French resumé accompanying the article.—*A. W. Evans.*

4455. Milsom, F. E. **Yorkshire bryologists at Ingleton.** Naturalist **1924**:244. 1924.—The following plants new to the vicinity of Ingleton, England, were seen: *Moerckia Flotowiana, Plagiochila tridenticulata,* and *Saccogyna viticulosa.*—*W. H. Burrell.*

4456. Murray, Jas. **Cumberland mosses.** Naturalist **1924**: 283. 1924.—The author gives a short list of mosses gathered near Ireby, England.—*W. H. Burrell.*

4457. Paul, H. [**Musci. I. Unterklasse Sphagnales.**] **Sphagnaceae (Torfmoose).** [**Sphagnaceae (peat-mosses).**] Engler, A., und K. Prantl. Die Natürlichen Pflanzenfamilien *2nd ed.* Vol. 10. *P. 105–125. Fig. 93–106.* 1923.—In the 1st edition the systematic account of *Sphagnum,* the single genus of the Sphagnaceae, was prepared by the late C. Warnstorf. The present author retains, with but few changes, the introductory paragraphs of the earlier work but presents a thorough revision of the species and higher subdivisions of the genus. He has compiled this from Warnstorf's Sphagnologia Universalis, published in 1911 as the 51st Heft of Engler's Pflanzenreich. The species recognized number 336 and are distributed as follows: Europe 61 (10 endemic), Asia 66 (34 endemic), North and South America 198 (148 endemic), Africa 48 (46 endemic), and Australia 51 (42 endemic). [See also this issue, Entries 4437, 4438, 4459, 4460, 4461, 4462.]—*A. W. Evans.*

4458 Pearson, Wm. H. **Hepaticae.** [In: **A systematic account of the plants collected in New Caledonia and the Isle of Pines by Mr. R. H. Compton, M. A., in 1914.—Part III. Cryptogams (Hepaticae-Fungi).** Jour. Linn. Soc. Bot. London **46**: 13–96. *Pl. 2–3.*] *P. 13–44.* 1922.—Most of the hepatics of New Caledonia are endemic. All species are closely related to Australian or Malayan forms. Sixty-two species and varieties are listed with data regarding stations and usually with critical remarks; of these species and varieties 31 are described as new: *Acrolejeunea Comptonii, Aneura Comptonii, A. macrantha, A. plana* var. *minor, A. pulchra, Balantiopsis neocaledonica, Brachiolejeunea macrobracteola, Chiloscyphus Beesleyanus, C. Comptonii, Drepanolejeunea Comptonii, D. microcarpa, Eulejeunea denudata, Frullania Comptonii, F. microscopica, Haplozia Comptonii, Hymenophytum furcatum, Lepidozia chaetocarpa, Leptocolea Comptonii, L. crenulata, Leptolejeunea dolabriformis, Lopholejeunea muensis* var. *microloba, Microlejeunea brunnea, Nowellia Langii, Plagiochila Comptonii, P. laciniata, Radula Farmeri, R. nigra, Symphyogyna neocaledonica, Trichocolea Comptonii, T. geniculata,* and *Zoopsis rigida.* Eight of the new species are figured.—*A. J. Eames.*

4459. Ruhland, W. **Musci. Allegemeiner Teil. [Mosses. General part.]** Engler, A., und K. Prantl. Die Natürlichen Pflanzenfamilien *2nd ed.* Vol. 10. *P. 1–100. Fig. 1–90.* 1924.—After giving a brief characterization of the mosses the author discusses the following topics: Spores, vegetative parts of the gametophyte, sexual organs and associated structures, fertilization and embryology of the sporophyte, anatomy of the sporophyte, vegetative reproduction, and division of the mosses into the subclass Sphagnales, Andreaeales and Bryales. In the 1st edition the morphology of the mosses was elaborated in part by the late C. Müller of Berlin and in part by the present author. In the treatment now presented few essential changes have been made, and the most important addtions are in the paragraphs dealing with multicellular spores, stem anatomy, dorsiventral shoots, leaf-development, heterosporous mosses, development of the sexual organs, and sporogenesis. [See also this issue, Entries 4437, 4438, 4457, 4460, 4461, 4462.]—*A. W. Evans.*

4460. Ruhland, W. [**Musci.**] **I. Unterklasse Sphagnales. Allgemeine Verhältnisse. [Subclass Sphagnales. General features.]** Engler, A., und K. Prantl. Die Natürlichen Pflanzenfamilien *2nd ed.* Vol. 10. *P. 101–105. Fig. 91–92.* 1923.—The author briefly characterizes the peat mosses and describes in detail the vegetative organs, the reproduction and the affinities of the group. He follows closely his treatment in the 1st edition but incorporates new data on vegetative reproduction and regeneration and now maintains definitely that the relationships of the Sphagnales are with the mosses rather than with the liverworts. [See also this issue, Entries 4437, 4438, 4457, 4459, 4461, 4462.]—*A. W. Evans.*

4461. Ruhland, W. [**Musci.**] **II. Unterklasse Andreaeales. Allgemeine Verhältnisse. [Subclass Andreaeales. General features.]** Engler, A., und K. Prantl. Die Natürlichen Pflanzenfamilien *2nd ed.* Vol. 10. *P. 126–128. Fig. 107.* 1924.—The author's characterization of the subclass Andreaealaes and his discussion of the vegetative organs, reproduction and affinities are essentially the same as in the 1st edition. [See also this issue, Entries 4437, 4438, 4457, 4459, 4460, 4462.]—*A. W. Evans.*

4462. Ruhland, W. [**Musci.**] **III. Unterklasse Bryales. I. Allgemeine Verhältnisse. [Subclass Bryales. General features.]** Engler, A., und K. Prantl. Die Natürlichen Pflanzenfamilien *2nd ed.* Vol. 10. 132–142. *Fig. 110–115.* 1924—The treatment of the general morphology of the Bryales is taken with but few changes from the 1st edition. The main topics considered are the distinctive features of the group, the vegetative organs, and the reproductive parts and processes. The most important additions are the paragraphs dealing with the hygroscopic movements of the peristome teeth.—[See also this issue, Entries 4437, 4438, 4457, 4459, 4460, 4461.]—*A. W. Evans.*

4463. Sasaoka, H. **On some new species of Musci.** (Japanese.) Bot. Mag. Tokyo **35:** (68)–(69). 1921.—Brief notes are given on a collection of mosses made by the author and sent for determination to V. F. Brotherus, who is authority for the following new species: *Acanthocladium Minakatae, Barbula trichostomoides, Brachythecium Buchanani* var. *gracile, B. decurrentifolium, Brotherella formosana, Bryhnia tenerrima, Bryum Sasaokae, Calypto-thecium formosana, Catharinaea grandiretis, Chionostomum rostratum* var. *microcarpum, Claopodium prionophylloides, Ctenidium longipes, Dicranum asperifolium, D. formosanum, D. Sasaokae, Didymodon giganteum* var. *japonicus, Ectropothecium pendulum, Entodon plagio-thecioides, Eurhynchium Hattorii, Hyophila linguaeformis, Isopterygium Sasaokae, Mielich-hoferia Sasaokae, Pireella formosana, Plagiothecium hygrophilium, Pterobryum subarbuscula, Rhynchostegium obtusatum, Thuidium glaucinium, Trismegistia pusilla, Vesicularia apiculata* var. *major, V. callicostelloides* and *Weisiopsis japonica.* [See also Bot. Absts. 13, Entry 3586.]—*Frederick V. Rand.*

4464. Tonas, Jaume. **Hepàtiques de la regió olotina. [Hepatics of the Olot region.]** Butll. Inst. Catalana Hist. Nat. **1918:** 178–181. 1918.—This is an annotated list of hepatics from the vicinity of Olot, northeastern Spain, comprising 26 Jungermanniales and 6 Marchantiales. No new spp. are included.—*Frederick V. Rand.*

4465. Van den Broeck, H. **Note sur la découverte de Barbula inermis C. Müll., mousse nouvelle pour la Belgique. [Discovery of Barbula inermis, a moss new to Belgium.]** Bull. Soc. Roy. Bot. Begique **57:** 107. 1924.—The discovery of this rare moss was made at Reinhardstein near Malmédy.—*E. DeWildeman.*

4466. Watson, W. **The liverworts of Somerset.** Somersetshire Archaeol. & Nat. Hist. Soc. 66: 134–159. *Fig. A-F.* 1921.—Following a short popular discussion of hepatics and a brief history of local collections, the main body of the paper is taken up with a copiously annotated list of the Somerset liverworts, including such data as locality and dates of collection, relative frequency of occurrence, character of habitat, and variations from type. Comparisons are also made with the liverwort floras of Devonshire and Gloucestershire.—*Frederick V. Rand.*

MORPHOLOGY AND TAXONOMY OF FUNGI, LICHENS, BACTERIA, AND MYXOMYCETES

H. M. Fitzpatrick, *Editor*

J. E. Flynn, *Assistant Editor*

(See also in this issue Entries 4012, 4138, 4156, 4309, 4567, 4571, 4572, 4582, 4591, 4611, 4698, 4763, 4765, 4769, 4775, 4783, 4784, 4785, 4791, 4798, 4799, 4801, 4816, 4820)

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4467. Bataille, F. **Flore analytique-descriptive des Hydnes terrestres d'Europe. [Analytical-descriptive flora of the European terrestrial species of Hydnum.]** Bull. Trimest. Soc. Mycol. France 39: 201–216. 1924.—The author gives a general description of the terrestrial Hydnaceae which constitute the section *Mesopus* of the genus *Hydnum* of Fries. Quélet has divided this group into 2 genera: *Sarcodon* and *Calodon*. Bataille proposes a 3rd genus: **Malacodon** F. Bat., with a single species, *Malacodon candidum* F. Bat. (= *Hydnum candidum*). This form is distinguished from *Tremellodon gelatinosum* by its habitat, and by its central stem which is long and stout. Analytic keys to the species of the genera *Sarcodon* and *Calodon* are given. The author describes 19 species and 3 varieties of the genus *Sarcodon*. The genus *Calodon* is divided into 18 species and 4 European varieties.—*S. Blumer.*

4468. Bataille, F., et R. Crawshay. **Un bolet de la Bourboule, variété minor du Boletus porphyrosporus. [A Boletus of Bourboule, a diminutive variety of Boletus porphyrosporus.]** Bull. Trimest. Soc. Mycol. France 39: 267–268. *Pl. 9.* 1924.—*Boletus porphyrosporus* Fr. var. *minor* Bat. & Crawshay which has been encountered in the neighborhood of Bourboule (Puy de Dôme) is distinguished from the type by its small size and particularly by the color of its flesh, which does not become blue near the pores when exposed to the air. This variety is related to *Boletus fuligineus* Fr. from which it is distinguished by its glabrous base and its larger size.—*S. Blumer.*

4469. Bellivier, J., et V. Dupain. **Note sur le Cortinarius pseudo-bolaris (Maire).—Cortinarius limonius (Quélet). [A note concerning Cortinarius pseudo-bolaris (Maire).—Cortinarius limonius (Quélet).]** Bull. Trimest. Soc. Mycol. France 39: 217–220. *Pl. 7.* 1924. —The relations between *Cortinarius pseudo-bolaris* (Maire), *C. bolaris* Pers. and *C. limonius* Fr. are given. The first 2 species belong to the section *Inoloma*, the third to the section *Telamonia*. The authors give a Latin diagnosis for *Cortinarius pseudobolaris.*—*S. Blumer.*

4470. Blagaić, K. **Prilozi flori višik gljiva okolice Plitvičkih Jezera. [A contribution to our knowledge of the higher fungi of the vicinity of Plitvice Seen.]** Glasnik Hrvatskog Pirodoslovnoga Društva [Zagreb] 33[1]: 10–44. 1921.—Seventy species are set forth from this region which has been hitherto, from a mycological point of view, unexplored territory. For most species, in addition to a mention of the habitat, many noteworthy facts are appended. In the appendix 17 species from the vicinity of Gospic are noted.—*I. Pevalek.*

4471. Blagaic, K. **Neke naše napomene vrijedne gljive. [Some of our noteworthy fungi.]** Glasnik Hrvatskog Prirodoslovnoga Deuštva [Zagreb] 35: 1–15. 1923.—The author discusses certain Croatian fungi which, while not rare, are noteworthy. In some cases the synonymy is discussed in detail and our knowledge of these fungi is extended. The following are considered: *Lepiota pudica* Bull., *Pleurotus olearius* DC. (= *Agaricus divisus* Schulzer, in Blagaić Glasnik 35: 3, 1923), *Pholiota aegerita* Brig., *Pholiota destruens* Brond., *Entoloma lividum* Bull., *Limacium pudorinum* Fr., *Boletus regius* Krombh., and *Boletus splendidus* Mart.

The author shows that the following are well established: *Gyrodon placidus* Bon., *Clathrus cancellatus* and *Verpa bohemica.*—*I. Pevalek.*

4472. Бондарцева-Монтеверде, В. Н. [Bondarzeva-Monteverde, V. N.] **De fungo novo in ramulis vivis Equiseti sylvatici.** [**A new fungus in the living branches of Equisetum sylvaticum.**] Ботанические Материалы Споровых Растений Главного Ботанического Сада Р. С. Ф. С. Р. [Notulae Systematicae Inst. Crypt. Hort. Bot. Petropolitani] 2: 18. 1923.—A Latin diagnosis is given of *Mycosphaerella equiseticola* n. sp.—*Frederick V. Rand.*

4473. Bose, S. R. **Une Polyporacée nouvelle de l'Inde.** [**A new polypore from India.**] Bull. Trimest. Soc. Mycol. France 39: 226. *Pl. 8.* 1924.—*Polyporus chocolatus* Bose, collected at Coimbatore (Madras), is described as a new species. This form differs from *Polyporus friabilis* in that its tissue is hard and its pores are chocolate brown contrasting with the dark brown color of the flesh.—*S. Blumer.*

4474. Bouchet, L. **Tou soc—Scabello tou soc.** Bull. Trimest. Soc. Mycol. France 39: 272–273. 1924.—Scabello tou soc. is in Brittany the common name of *Psalliota campestris-pratensis.*—*S. Blumer.*

4475. Bourdot, H., et A. Galzin. **Heterobasidiae nondum descriptae.** [**New Heterobasidiae.**] Bull. Trimest. Soc. Mycol. France 39: 261–266. 1924.—The authors give Latin diagnoses of 22 new species: *Platygloea micra, P. vestita, Tremella spicata, T. glacialis, T. fusispora, Sebacina laccata, S. mesomorpha, S. opalea, S. sphaerospora, Exidiopsis calospora, Tulasnella lactea, T. rosella, T. albo-lilacea, T. pruinosa, T. rubropallens, T. bifrons, T. vernicosa, T. sordida, T. obscura, T. araneosa, Gloeotulasnella metachroa* and *Ceracea crustulina.*—*S. Blumer.*

4476. Ciferri, R. **Prima contribuzione allo studio degli "Ustilaginales."** [**First contribution to the study of the Ustilaginales.**] Boll. Soc. Bot. Italiana 2–3. *46–59.* 1924.—The writer discusses 22 species of the genera *Tolyposporium, Entyloma* and *Melanotaenium*, and describes the following new combinations and species: *Tolyposporium crepidis-rubri* (Jaap) n. comb., *Entytoma Maireanum* n. sp., *E. scalianum* n. sp., *E. chelidonii* n. sp., *E. borraginis* n. sp., *E. nigellae* n. sp., *E. eryngii-plani* n. sp., *E.* (?) *dactylidis* (Passerini) n. comb., *Melanotaenium arisari* (Peglion) n. comb., *M. erodianum* (Saccardo) n. comb., *M. Arnaudianum* n. sp., *M.* (?) *Dietelianum* (Bubak) n. comb. (See also Bot. Absts. 14, Entry 2774.)—*G. L. Zundel.*

4477. Cleland, J. B. **The fauna and flora of Nuyts Archipelago and the Investigator Group. No. 14: The basidiomycetous flora of Pearson Island, Great Australian Bight.** Trans. and Proc. Roy. Soc. South Australia 47: 365–366. 1923.—The collections were made in summer after a dry period. The following are recorded: *Polystictus cinnabarinus, Polyporus decipiens, Corticium* sp., *Polysaccum pisocarpium tuberosum, Lycoperdon polymorphum, Catastoma* sp., *Geaster minimus, G. fornicatus, G. saccatus,* and *G.* sp.—*Wm. Randolph Taylor.*

4478. Cleland, J. B., and E. Cheel. **Australian fungi: notes and descriptions. No. 4.** Trans. and Proc. Roy. Soc. South Australia 47: 58–78. *Pl. 1, 2.* 1923.—This is an annotated list of 129 species, in part supplementary to earlier lists and in part giving additional data for forms already listed. The authors describe as new: *Amanitopsis subvaginatis, Marasmius subinstitius, M. rugoso-elegans, Cantharellus cinereus* Fries var. *australis, C. triangularis, Boletus subglobosus,* and *Scleroderma flavidum* Ellis var. *fenestratum.*—*Wm. Randolph Taylor.*

4479. Coker, William C. **The Clavarias of the United States and Canada.** *209 p. Pl. 1–92.* (*part colored.*) Univ. North Carolina Press: Chapel Hill, N. C., 1923.—The author's treatment is monographic in character, and is based upon the study of both living and preserved material. The genus *Clavaria* is chiefly concerned, but descriptions of a few species of *Lachnocladium, Pterula,* and *Typhula* are given. The species are extensively illustrated by photographs of living fruit-bodies and by line drawings of microscopic characters. Keys to the recognized genera of the Clavariaceae and to the species of *Clavaria* are given. The following new species and new varieties are described: *C. appalachiensis* n. sp., *C. subbotrytis* n. sp., *C. subbotrytis* var. *intermedia* n. var., *C. flava* var. *subtilis* n. var., *C. conjunctipes* n. sp., *C. conjunctipes* var. *odora* n. var., *C. subspinulosa* n. sp., *C. gelatinosa* n. sp., *C. verna* n. sp., *C. aurea* var. *australis* n. var., *C. cacao* n. sp., *C. subdecurrens* n. sp., *C. decurrens* var. *australis* n. var., *C. Murrilli* n. sp.—*H. M. Fitzpatrick.*

4480. Coker, William C. **The Saprolegniaceae with notes on other water molds.** *201 p.*

Pl. 1–63. Univ. North Carolina Press: Chapel Hill, North Carolina, 1923.—The author presents an extensive monographic treatment of the Saprolegniaceae, the species being profusely illustrated and the technical diagnoses being accompanied by extensive supplementary discussions. The key to genera departs from the older separation especially in the case of the genus *Aplanes*, where especial emphasis is placed on the characters of the sexual organs and an emended generic description given. The genus *Isoachlya* Kauffman is recognized, but one of the species, *I. paradoxa*, originally included is removed and made the basis of the new genus **Protoachlya**. Two new species of *Isoachlya* are included: *I. unispora* Coker and Couch and *I. eccentrica* Coker. In *Protoachlya* some of the escaping swarmspores encyst in an irregular clump at the mouth of the sporangium, while the others swim away. Secondary sporangia sometimes arise by proliferation, and sometimes on lateral branches below the primary. The genus is thus intermediate between *Achlya* and *Saprolegnia*. The spelling of *Saprolegnia Kauffmanniana* Pieters is changed with the author's consent to *S. Kauffmaniana* Pieters. The following additional new species, new varieties and new combinations are given: *Saprolegnia delica* n. sp., *S. litoralis* n. sp., *S. megasperma* n. sp., *S. parasitica* n. sp., *Aplanes Treleaseanus* (Humphrey) n. comb. based on *Saprolegnia Treleaseana* Humphrey, *Achlya proliferoides* n. sp., *A. flagellata* n. sp., *A. imperfecta* n. sp., *A. apiculata* var. *prolifica* Coker & Couch. n. var., *A. conspicua* n. sp., *A. dubia* n. sp., *Dictyuchus sterile* n. sp., and *A. parasiticus* n. sp.—Descriptions of some of the Leptomitaceae, Blastocladiaceae, and Monoblepharidaceae are given, and some of the chytrid parasites of water molds are discussed. In the genus *Olpidiopsis*, *O. Saprolegniae* var. *levis* n. var. is described.—*H. M. Fitzpatrick.*

4481. Coupin, Henri. **Album Général des Cryptogames, Algues, Champignons, Lichens.** [**A general album of the cryptogams. Algae, fungi, lichens.**] *Vol. 1–4. Pl. 1–708.* Pub. by author: Paris, no date.—This work, as projected, will comprise 55 fascicles, 45 of which have already appeared, making up the first 4 volumes. It consists of a series of plates, mostly if not entirely taken from previous works, 315 of which are devoted to the fungi and 393 to the algae.—*J. E. Flynn.*

4482. Dittrich, G. **Über Auftreten und Wachstumsbedingungen von höheren Pilzen.** [**The appearance and growth conditions of the higher fungi.**] Ber. Deutsch. Bot. Ges. **41**: 128–134. 1923.—The author gives lists of the fungi found in different localities together with the dates of appearance and the conditions surrounding their development.—*Hally Jolivette Sax.*

4483. Dodge, B. O. **The life history of Ascobolus magnificus—origin of the ascocarp from two strains.** Mycologia **12**: 115–134. *Pl. 7–8*, fig. *1–28*. 1920.—The ascocarp of *Ascobolus magnificus* originates from a pair of morphologically distinct primorida—a large ascogonium the end of which functions as a trichogyne, and a club-shaped antheridium.—*Papulospora magnifica* Hotson is an asexual stage of *Ascobolus magnificus* Dodge.—The intrahyphal mycelium found in old cultures is simply a case of "Durchwachsungen," or "cordon interne."—The strains here reported, which were obtained from germinated papulospores or ascospores, were self-sterile in the experiments conducted, but always produced papulospores.—Sexual reproduction occurs in cultures containing 2 strains properly chosen.—*Authors' Summary.*

4484. Dupain, V. **Un curieux cas de tératologie de l'Entoloma lividum.** [**A curious case of teratology in Entoloma lividum.**] Bull. Trimest. Soc. Mycol. France **39**: 274. 1924.—The author describes a monstrosity in *Entyloma lividum*. The cap is cream-rose, convex, presents numerous sinuosities, and has the aspect of a cauliflower. The cap is covered by a hymenium of daedaliform pores.—*S. Blumer.*

4485. Fischer, Ed. **Pilze (inkl. Flechten).** [**Fungi—including lichens.**] Ber. Schweiz. Bot. Ges. **30–31**: (1)–(21). 1922.—A bibliography of papers published during 1920 and 1921 of special interest to Swiss students of mycology is given. This is followed by a list of noteworthy fungi and lichens recently collected in Switzerland, those new to the country being starred.—*H. M. Fitzpatrick.*

4486. Fischer, Ed. **Pilze.** [**Fungi.**] Ber. Schweiz. Bot. Ges. **32**: (1)–(22). 1923.—A bibliography of mycological papers of special interest to Swiss students is followed by a list of noteworthy fungi collected in Switzerland in recent years. *Endogone guttulata* n. sp. is described.—*H. M. Fitzpatrick.*

4487. Fischer, Ed. **Mykologische Beiträge. 27. Zur vergleichenden Morphologie der Fruchtkörper von Staheliomyces, Xylophallus und Mutinus.** [Mycological contributions 27. The comparative morphology of the fruit-bodies of Staheliomyces, Xylophallus and Mutinus.] Mitteil. Naturf. Ges. Bern 1923: 39–49. *1 pl., fig. 1–4.* 1924.—*Staheliomyces cinctus* Ed. Fischer apparently occurs abundantly in Surinam and British Guiana. The author investigated in young fruit-bodies the origin of the characteristic arrangement of spore masses on the receptacle. The primordium of the gleba in *Staheliomyces* arises as in *Mutinus* except that it is bulged out, exhibiting in median longitudinal section an upper and a lower cavity. The axis of the stem is swollen at the apex of the gleba in the case of *Staheliomyces*. In later stages of development, the trama plates converge towards the swollen region of the receptacle-primordium, while in *Mutinus* they are arranged almost perpendicularly against the axis of the receptacle. The girdled arrangement of the gleba in *Staheliomyces* results later from this fact, while in *Mutinus*, the entire upper portion of the receptacle is covered with fertile tissue. The young fruit-body of *Mutinus xylogenus* shows, like other species of *Mutinus*, a gleba-primordium broken at the apex. On the other hand it is shown that in *Mutinus xylogenus* the axial strand of tissue does not extend to the tip of the volva, but comes to an end beneath the apex. From this point closed hyphal tissues extend out on all sides. In this respect *Mutinus xylophallus* approaches the genus *Aporophallus* Möller. Perhaps it would be desirable to separate *Mutinus xylophallus* from the above named species of *Mutinus*, and to consider it as a definite genus, *Xylophallus* Montagne.—*S. Blumer.*

4488. Fischer, Ed. **Mykologische Beiträge. 28. Tremellogaster surinamensis nov. gen. et spec. ein neuer Vertreter der Gastromyceten.** [Mycological contributions. 28. Tremellogaster surinamensis nov. gen. et spec., a new representative of the gastromycetes.] Mitteil. Naturf. Ges. Bern 1923: 49–56. *Fig. 5–8.* 1924.—The work contains the description of a gastromycete, Tremellogaster *surinamensis* Ed. Fischer, found in Surinam, and which apparently belongs to the Lycoperdaceae. The new genus is characterized by cord-like mycelium and round fruit-bodies occurring above ground. The peridium is very thick, with a gelatinous middle layer, which is broken through by net-like anastomosing plates of non-gelatinous tissue. The inner layer of the peridium is not gelatinous. The gleba is at maturity powdery and has no capillitium. The spores are spherical, brown and sculptured. The single species, *Tremellogaster surinamensis*, has a fruity-body 4–7 cm. in diameter with a wrinkled surface, strewn with numerous mycelial strands. The peridium in its inner zone is built up of hyphae with transversely plaited walls. The spores have a diameter of 5–6μ. The relation of the genus to *Clathrogaster* is discussed.—*S. Blumer.*

4489. Fischer, Ed. **Mykologische Beiträge. 29. Puccinia Pulsatillae Kalchbr. (Syn. P. de Baryana Thüm.) und die Beziehungen zwischen Spezialisation und systematischer Verwandtschaft der Wirtspflanzen.** [Puccinia Pulsatillae Kalchbr. (Syn. P. de Baryanum Thüm.) and the connection between specialization and systematic relationship of host plants.] Mitteil. Naturf. Ges. Bern 1923: 56–58. 1924.—In earlier works the author has demonstrated that the forma specialis *Pulsatillarum* of *Puccinia Pulsatillae* lives only on the species of Anemone of the subgenus *Pulsatilla*, section *Campanaria*. From an infection experiment with teleutospores from *Anemone alpina* the author concludes that the forma specialis on *Anemone alpina* does not pass over to the species of *Anemone* of the section *Campanaria* nor to *Atragene alpina*. Specialization of *Puccinia Pulsatillae* Kalchbr. proceeds parallel with the systematic relationship of the host plants.—*S. Blumer.*

4490. Fischer, Ed. **Mykologische Beiträge. 30. Der Aecidienwirt von Uromyces Jordianus Bubàk. (Gemeinsam mit Dr. Kobel.)** [Mycological Contributions. 30. The aecidial host of Uromyces Jordianus Bubak. (Jointly with Dr. Kobel.).] Mitteil. Naturf. Ges. Bern. 1923: 59–60. 1924.—Infection experiments with teleutospores of *Uromyces Jordianus* Bubàk on *Astragalus excapus* show that the aecidia occur on *Euphorbia cyparissias*. They cause here the same deformations as the other species of *Uromyces* inhabiting Papilionaceae.—*S. Blumer.*

4491. Garbowski, L. **Les Micromycètes de la Crimée et des districts limitrophes de la Russie méridionale en considération spéciale des parasites des arbres et des arbrisseaux fruitiers.** [The microscopic fungi of Crimea and of the regions bordering on southern Russia with special reference to the parasites of trees and of fruit-bearing shrubs.] Bull. Trimest.

Soc. Mycol. France 39: 227–260. *Pl. 9–10, 3 fig.* 1924.—This work gives a list of 311 species of parasitic fungi collected in different localities of the Crimea during 1916 and 1917. Among the fungi enumerated there are 23 new species and 5 new varieties: *Leptosphaeria Woodrowi Wilsoni* on *Eryngium campestre*, *Ophiobolus prunicola* on *Prunus avium*, *Sphaerulina violae* on *Viola* sp., *Phyllosticta berberidis* on *Berberis vulgaris*, *P. galegae* on *Galega officinalis*, *P. cirsii lanceolati* on *Cirsium lanceolatum*, *P. tussilaginis* on *Tussilago farfara*, *P. urticina* on *Urtica dioica*, *P. minuta* on *Agropyrum repens*, *P. biflori* on *Cytisus biflorus*, *P. hedysarina* on *Hedysarum tauricum*, *P. resedicola* on *Reseda lutea*, *Phacosphaeria agropyri* on *Agropyrum repens*, *Cytospora astragali* on *Astragalus vesicarius*, *Ascochyta campanulae* on *Campanula bononiensis*, *Cytodiplospora hedysari* on *Hedysarum tauricum*, *Septoria artemisiana* on *Artemisia vulgaris*, *S. cytisina* on *Cytisus ratisbonensis*, *S. resedae* on *Reseda lutea*, *Septogloeum pistaciae* on *Pistacia muttica*, *Cercosporella echinulata* on *Malachium aquaticum*, *Helminthosporium cucumericum* on *Cucumis sativus*, *Cladorrhinum ricini* on *Ricinus communis*, *Lophodermium paeoniae* Rehm. var. *corallinae* on *Paeonia corallina*, *Massaria vomitoria* B. et C. var. *taurica* on *Robinia pseudacacia*, *Cercospora acerina* Hartig. var. *tatarici* on *Acer tataricum*, *Septoria ari* Desm. var. *orientalis* on *Arum orientale*, and *Coryneum microstictoides* Sacc. & Penzig var. *Sanguisorbae* on *Poterium Sanguisorba*.—The author names as new host plants: *Dorycnium latifolium* for *Uromyces anthyllidis* (Grev.) Schröt., and *Geranium* sp. for *Phyllactinia corylea* (Pers.) Karst.—The work contains some notes as to the biology of certain parasitic fungi, particularly on the formation of ascospores in *Sphaerotheca pannosa*.—*S. Blumer.*

4492. Grigoraki, L. **Contribution á l'étude des Dermatophytes. [A contribution to the study of Dermatophytes.]** Compt. Rend. Acad. Sci. Paris **179**: 1423–1425. 1924.—This is a study of the cytology and morphology of the dermatophytes belonging to the genera *Microsporon*, *Trichophyton*, *Achorion*, *Epidermatophyton*, and *Endodermatophyton*. Fungous parasites belonging to very different species, genera, and groups are generally known to produce the same symptoms of disease; likewise, the same species may cause many types of lesions. The clinical basis of classification of fungi is thus regarded as unsatisfactory. The genera noted above are established on such a clinical basis, and hence their classification requires revision. In culture media they are pleomorphic. On the basis of studies here described they are regarded as belonging to the Gymnoascaceae, either to this group proper or to the Atelogymnoascaceae. The former are characterized by perithecia, and include *Trichophyton Currii*, and *Eidamella*. The latter include *Spirallia*, *Closterosporia*, *Closteroaleurosporia*, *Chlamydoaleurosporia*, and *Aleurosporia*. The genera of dermatophytes above mentioned do not produce chlamydospores, aleurospores, or "fuseaux," but do form arthrospores. It is thus suggested that they be included in a genus, **Arthrosporia**.—*C. H. Farr.*

4493. Grove, W. B. **New or noteworthy fungi—IX.** Jour. Bot. **60**: 167–177. 1922.—The present instalment concludes Part IX of this series of papers on new or noteworthy fungi. The following species and forms, all natives of Great Britain, are described as being new to science: *Achroomyces carpineus*, *Phomatospora*, *Sphaerulina*, *Didymella Cortadeniae*, *Cercosporella Oxalidis* and *Didymella culmigena* f. *endorhodia*. One new combination is made, *Ovularia Doronici* Sacc. becoming *Ramularia Doronici*.—*Adele Lewis Grant.*

4494. Haenseler, C. M., William D. Moore., and J. G. Gaines. **Fungi and algae of the sprinkling filter bed (of a sewage disposal plant) with special reference to their seasonal distribution.** New Jersey Agric. Exp. Sta. Bull. 390. *P. 39–48. Pl. 1–2, fig. 21–22.* 1923.—This paper presents one phase of a series of studies by various workers on the biology of sewage disposal and gives the results of a preliminary study of the seasonal fluctuations of the fungi, algae and filamentous bacteria found in the sprinkling filter beds.—Descriptions and drawings of the 5 most prevalent species of fungi are given but no systematic study is recorded. The fungi listed are species of *Pythium* and *Dictyuchus*, species probably belonging to *Penicillium* and Oidium and a form of unknown genetic relationship.—Of the algae, *Stigeoclonium*, *Protococcus*, and *Oscillatoria* were the most abundant.—Frequent microscopic examinations over a period of 16 months demonstrated a decided seasonal fluctuation in the abundance of fungi and filamentous bacteria. The fungi reached a maximum in the winter months and a minimum during July, and vice versa for the filamentous bacteria.—These preliminary studies show that fungi are an important part of the flora of the filtering beds and probably play a role in the proper functioning of the biological film.—*C. M. Haenseler.*

4495. Höhnel, Franz von. **Beitrag zur Mikromyzetenflora von Java.** [Contribution to the flora of micro-fungi of Java.] Bull. Jard. Bot. Buitenzorg 3^6: 1–8. 1924.—The descriptions of Javanese micro-fungi in this article, collected and determined by Höhnel who died in 1920, are edited from Höhnel's manuscript by his successor Josef Weese. Besides an emended description of the genus *Pachypatella* Theiss. & Sydow which is referred to the Tryblidiaceae, the following genera and species are described as new: *Psiloglonium microspermum, Phaeangella anisospora, Cenangina palmarum, Leptobelonium vexatum, Cytoplea verrucispona, Aschersonia scutelliformis, Zythiostroma patinelloideum,* Phragmodochium, n. gen., *P. modestum,* Septoriopsis n. gen., and *S. Pandani.*—*Alfred Rehder.*

4496. Kauffman, Calvin H. **Inocybe (Fries) Quél.** North Amer. Flora **10**: 227–260. 1924.—This monograph includes 105 species, some of which are new.—*H. M. Fitzpatrick.*

4497. Killian, Ch., and V. Likhité. **Observations sur le genre Lophodermium.** [Observations on the genus Lophodermium.] Compt. Rend. Soc. Biol. **91**: 574–576. *15 fig.* 1924.—The life history of *L. hysterioides* Pers. (Sacc.), a parasite on *Crataegus monogyna,* is given with additional notes on *L. petiolicolum* (on *Quercus*), *L. macrosporum,* and *L. pinastri.* The epicuticular mycelium estivates with the result that the conidiophores are not produced until after the fall of the leaves, resulting in a parasitism not very remote from saprophytism.—*Oran Raber.*

4498. Klebahn, H. **Fabraea fragariae, die Schlauchfruchtform der Marssonina fragariae.** [Fabraea fragariae, the leather fruit form of Marssonina fragariae.] Ber. Deutsch. Bot. Ges. **42**: 191–197. *1 fig.* 1924.—By means of a culture study the author connected *Fabraea fragariae* with *Marssonina fragariae.*—*Hally Jolivette Sax.*

4499. Langeron, Maurice. **Un Sterigmatocystis nouveau, parasite de l'homme en Tunisie: S. tunetana n. sp.** [A new Sterigmatocystis, parasitic on man in Tunis.] Bull. Soc. Path. Exot. **17**: 345–347. *1 fig.* 1924.—The fungus isolated by Blanc and Caillon (Ibid. **17**: 343–345. *Fig. 1.* 1924.) is figured and described as *Sterigmatocystis tunetana* n. sp.—*Philip Brierley.*

4500. Лебедева, Л. А. [Lebedeva, L. A.] **Fungi novi in Horto Botanico Petropolitano annis 1921–22 collecti IV.** [New fungi collected in the botanical garden at Leningrad 1921–22. IV.] Ботанические Материалы Института Споровых Растений Главного Ботанического Сада Р.С.Ф.С.Р. [Notulae Systematicae Inst. Crypt. Hort. Bot. Petropolitani] **2**: 19. 1923.—Latin diagnoses of the following are given: *Phoma onocleae* n. sp., *Phomopsis hakeae* n. sp., and P. *Elenkinii* n. sp.—*Frederick V. Rand.*

4501. Magalhaes, Octavio de. **A propos des teignes observées au Rio Grande do Sul, Brésil.** [Ring worms observed at Rio Grande do Sul, Brasil.] Compt. Rend. Soc. Biol. **90**: 53–55. *2 fig.* 1924.—Cultural characters are given with relations to neighboring genera and species. The form under discussion is called *Microsporum circuluscentrum,* n. sp.—*Oran Raber.*

4502. Marshall, Nina L. **The mushroom book. A popular guide to the identification and study of our commoner fungi, with special emphasis on the edible varieties.** *xxx + 173 p. Illus. (col. in part).* By J. A. and H. C. Anderson. The New Nature Library, Doubleday, Page & Co.: Garden City, New York, 1923.

4503. Moesz, G. **A növények gombaokozta betegségeiröl szóló ismeretek fejlödése házankban.** [The development of knowledge concerning fungous diseases of plants in Hungary.] Bot. Közlemények [Budapest] **21**: 1–32. 1924.—The 1st contributions on plant diseases were made by J. Lippay (1664–1667); the first microscopic investigations by St. Lumnitzer (1791). The author gives a searching review of the professional literature dealing with smut (since 1777), ergot (since 1777), potato diseases (since 1843), diseases of the grape (since 1843) and of fruit trees (since 1809). The paper closes with an exceptionally complete bibliography.—*Istvan Györffy.*

4504. Morse, Albert Pitts. **List of the water-color drawings of fungi by George E. Morris in the Peabody Museum of Salem.** *70 p.* Peabody Museum: Salem, Massachusetts, 1918.

4505. Oehlkers, F. **Die Sporebildung einiger Saccharomyces.** [Spore formation in some species of Saccharomyces.] Ber. Deutsch. Bot. Ges. **41**: 31–32. 1923.—Spore formation

in the yeasts, *Saccharomyces Odessa* and *S. Johannisberg*, are dependent on the concentration of the substratum. Though the limits are not narrow, the yeast thrives best in a concentration whose pH value is 7.2–7.4, which is slightly alkaline. Filter paper and other absorbing substances may act as buffer systems. They bring the concentration to neutral, thus favoring spore formation.—*Hally Jolivette Sax.*

4506. Overholts, Lee O. **Pholiota (Fries) Quél.** North Amer. Flora **10**: 261–276. 1924.—A monographic treatment is given of the genus including 45 species, some of which are new.—*H. M. Fitzpatrick.*

4507. Prát, Silvestr. **Die Pilze in den Wespennestern. [The fungi found in wasps' nests.]** Ber. Deutsch. Bot. Ges. **42**: 225–226. 1924.—Cultures were made from the fungi in wasps' nests. The author found 2 species, one of the *Dermatiaceae* (Dermatium ?) and an *Alternaria* similar to *A. tenuis* Nees. Paper on which they were grown developed the same color as the wasp nest. The fungi, by producing much slime, seem to strengthen the nest. —*Hally Jolivette Sax.*

4508. Rytz, W. **Ein merkwürdiger Pilz vom Gornergrat. [A noteworthy fungus from Gornergrat.]** Mitteil. Naturf. Ges. Bern **1923**: lix–lx. 1924. (Abstract.)—The author found at Gornergrat (Wallis) the fruit-body of a fungus which he places close to *Onygena arietina* Ed. Fischer. This form described by Fresenius as *Heydenia alpina* must now be called *Onygena alpina* (Fres.) Rytz. The genus *Heydenia* Fres. is invalid. Likewise *Rupinia pyrenaica* Speg. et Roum. (*Rupinia Baylacii* Roum.) is synonymous with *Onygena alpina.*— *S. Blumer.*

4509. Schilberszky, K. **Az anyarozs varjúköröm élettörténete és használata. [Ergot and its uses.]** Természettudományi Közlöny [Budapest] **56**: 36–42. *Fig. 1–10.* 1924.

4510. Schwarz, E. **Die pilze in morphologisch-biologische betrachtung unter besonderer Berücksichtigung der fleischigen Pilze gemeinverständlich. [The fungi from a morphological-biological point of view, with special consideration of the fleshy fungi.]** *4+1–47 p.* L. Scheermessers Hofbuchhandlung: Salzungen, [1920].—A brief elementary popular discussion of the fungi.—*J. E. Flynn.*

4511. Sydow, P., and H. Sydow. **Monographia Uredinearum. [Monograph of the Uredinales.]** **4**: 1–352. Gebrüder Bornträger: Leipzig, 1923.—Two fascicles of this volume have appeared treating the unconnected species of the form genera, *Peridermium* and *Aecidium* (pars.). The species are arranged by hosts, and technical descriptions resembling those in the earlier volumes are given.—*H. M. Fitzpatrick.*

4512. Ванин, С. И. [Vanin, S. I.] **Новые и редкие виды Гименомицетов из Тамбовской губ. [New or rare hymenomycetes from the Tambovsk province.]** Ботанические Материалы Института Споровых Растений Главного Ботаничіеского Сада Р. С. Ф. С. Р. [Notulae Systematicae Inst. Crypt. Hort. Bot. Petropolitani] **2**: 15–16. 1923.—Diagnoses in Russian are given for the following: *Polyporus minutus* n. sp., *Polystictus perennis* (L.) Fr. var. *alba* n. var., *Coniophora atrocinerea* Karst. and *Phlebia hispidula* Berk.—*Frederick V. Rand.*

4513. Weir, James R. **Fomes roseus (A. & S.) Cke. and Trametes subrosea nom. novum.** Rhodora **25**: 214–220. 1924.—There has been much confusion in American literature concerning the identity of *Fomes roseus* and a fungus commonly called *Trametes carnea* Nees. The author shows that the original *Polyporus carneus* Blume & Nees was a Javan fungus collected by Blume and that it has nothing to do with the American species. He analyzes the literature in detail and traces the applications of various names—*Polyporus rubidus, P. Palliseri, P. arcticus,* etc.—and proposes for the *Trametes carnea* of American authors the new name *T. subrosea.* The discussion closes with comparisons of the 3 American species which are likely to be confused, *T. subrosea, T. Feei* and *Fomes roseus.*—*M. L. Fernald.*

4514. Weir, James R. **Note on Poria fatiscens.** Rhodora **25**: 163–165. 1923.—A comparison of types of some Porias leads to the conclusion that *P. fatiscens* (Berk. & Rav.) Cke. includes *P. tenella* (Berk. & Cke.) Cke., *P. semitincta* (Pk.) Cke. and *P. subviolacea* Ellis & Ev.—A redescription of the species and citation of specimens are given.—*M. L. Fernald.*

LICHENS

4515. Du Rietz, G. Einar. **Die Soredien und Tsidien der Flechten.** [Soredia and isidia of the lichens.] Svensk Bot. Tidskr. **18**: 371–396. 1924.—The paper contains suggestions as to the terminology of these organs. It begins with a historical review of the literature on the subject since Acharius. This author regarded as soredia parts of the thallus from which "propagula" are detached, whereas Reinke, Darbishire and others named the soredia of Acharius "Sorale" and the propagula of Acharius soredia. The author does not think this convenient and proposes to go back to the Acharian terminology. He regards soredia as all parts of a lichen that lack cortex and produce an excess of gonidia that are detached, together with hyphae, as reproductive organs (soredial grains or propagula). Tsidea are all kinds of smaller protuberances from the thallus that contain gonidia. The following main types of soredia are distinguished: soredium diffusum (the whole cortex or the greater part of it dissolved into a continuous soredium); soredia limitata, of which soredia superficialia, marginalia and lateralia are limited to the surface and margin of a dorsiventral thallus or the sides of a radial one, while soredia apicalia and subapicalia are found on the apices of the lobes of the thallus and soredia insidialia on the apices of isidia. Of the superficial, marginal and lateral soredia the following sub-types are recognized: soredia punctiformia (minute points), soredia maculiformia (spots), rimiformia (narrow fissures), limbiformia (borders along the edge of leaf-like thalli) and maniciformia (cuff-like, with a hole in the middle).—The apical soredia are divided into soredia capitiformia and subcapitiformia (head-like), labriformia (form of lips) and formiciformia (like a helmet).—The isidia are divided into autonomous, arising through simple out-growth from the cortex, and soredial isidia, arising as out-growths from soredial grains. Of the former are distinguished: isidia verruciformia (small papillae), cylindrica (cylindrical), claviformia (club-shaped), squamiformia (squamiform) and coralliformia (coralloid).—The author regards the soredia-carrying lichens as genotypically distinguished from the soredia-free parallel forms, not as mere modifications. Whether such parallel forms should be regarded as different species is, on the other hand, uncertain. Very often soredia-carrying forms differ from soredia-free, adjacent forms in other respects as well, and should then best be regarded as different species. Strictly parallel forms, differing in respect of soredia only, are of 2 types: Soredial forms are very rare, occurring only occasionally within the range of the non-soredial forms, or they have a more or less wide geographical distribution, often different from the distribution of the parallel forms. The former type of soredial forms should be regarded as varieties, the latter as species. Instances of pairs of species of this kind are *Lepharia vulpina—L. californica; Parmelia furfuracea—P. Cladonia; Caloplaca elegans—C. sorediata.* Increased formation of soredia and insidia is caused by impure air (as in the neighbourhood of cities), strong light or deep shadow (all unfavorable conditions) but not by moisture. *Cetraria juniperina* (L.) Ach. var. *pseudopinastri* and its var. *alvarensiformis*, *C. aculeata* (Schreb.) Fr. var. *sorediata*, *C. odontella* Ach. var. *sorediata*, *C. Delisei* (Bory) Th. Fr.* *sorediifera* (Malme) (= *f. sorediifera* Malme), *C. hepatica* (Ach.) Wain.* *Frostii* (*Parmelia Frostii* Tuck.), *Evernia esorediosa* (*Evernia mesomorpha* f. *esorediosa* Müll. Arg.), *Parmelia Cladonia* (Tuck) (*Evernia furfuracea β Cladonia* Tuck.) are new species, varieties or combinations, Du Rietz being the authority.—*O. H. Heilborn.*

4516. Frey, E. **Epiphylle Flechten.** [Epiphyllous lichens.] (Abstract.) Mitteil. Naturf. Ges. Bern **1923**: lvii–lviii. 1924.—In the Central European flora only the needles of conifers and the leaves of such evergreen plants as *Buxus* and *Ilex* serve as substrata for epiphyllous lichens. On the leaves of *Buxus*, the following lichens were found in Switzerland: *Strigula buxi* Chod., *Physcia tenella* (Scop.) Bitter>*ascendens* Bitter, *Physcia tenella* (Scop.) Bitter, *Xanthoria parietina* (L.) Th. Fr., *Candelaria concolor* (Dicks.) Wain., *Parmelia subaurifera* (Arn.) Nyl., and *Parmelia sulcata* Tayl. The following grow particularly on needles of conifers: *Catillaria Bouteillii* (Desm.) Zahlbr. and *Philocarpon leucoblepharon* (Nyl.) Wain. In adaptation to epiphyllous existence the lateral and ventral "Rhizines" terminate in a hyphal strand which is widened in the form of a fan, and designated by the author as the "Haftplatte."—*S. Blumer.*

4517. Kilian, Ch., and R. G. Werner. **Cultures pures des Champignons de Lichens.** [Pure cultures of the fungi of lichens.] Compt. Rend. Acad. Sci. Paris **179**: 1339–1342. *Fig.*

1–10. 1924.—The stages in the development of the germtubes and mycelium formed from the unicellular ascospores of *Cladonia squammosa* on synthetic media are given. After 5 months they measured 5.3 mm. Other species were also studied in a similar way.—*C. H. Farr.*

4518. Magnusson, A. H. **New species of the genus Acarospora.** Svensk Bot. Tidskr. **18:** 329–342. 1924.—*Acarospora insignis, A. praeruptarum, A. complanata, A. degenerans, A. Freyii, A. helvetica, A. opaca, A. sphaerospora, A. Suzai* and *A. Magnussoni* are described as new, the last mentioned being described by G. Sampaio. The new species were found in Sweden, Great Britain, Switzerland, Italy, Czechoslovakia, France or Portugal.—*O. Heilborn.*

4519. Robbins, C. A. **Cladonia Beaumontii in Massachusetts.** Rhodora **25:** 46, 47. 1923.—*Cladonia Beaumontii* (Tuck.) Waino, ordinarily considered a plant of the Southern States, was found at Wareham, Massachusetts. A statement of diagnostic characters and a comparison with related species are given.—*M. L. Fernald.*

4520. Robbins, C. A. **Some new Cladonias.** Rhodora **26:** 145–148. 1924.—The new Cladonias discussed are: *Cladonia clavulifera* Wainio n. sp. from Massachusetts, with m. *subvestita* Robbins n. modif.; *C. carassensis* Wainio from Massachusetts, heretofore known only from Brazil; *C. carassensis* f. *subregularis* Wainio n. f., f. *obliqua* Robbins n. f., and m. *spectabilis* Robbins n. modif.; *C. furcata* var. *racemosa* (Hoffm.) Floerk. m. *subclausa* Seudstede n. modif.; *C. subcariosa* (Nyl.) Wainio m. *squamulosa* Robbins n. modif.; *C. uncialis* (L.) Web. m. *soraligera* Robbins n. modif.; and other species and varieties not previously recorded for New England.—*M. L. Fernald.*

4521. Sántha, L. **Adatok Tolna vármegye zuzmóflorájának ismeretéhez.** [**The lichen flora of Tolnaër Komitates.**] Bot. Közlemények [Budapest] **21:** 47–60. *Pl. 1–2.* 1924.—The author enumerates 110 species and 33 varieties of which the following are new: *Arthropyrenia Mori* Sántha n. sp. on *Morus nigra; Opegrapha diaphora* var. *stellata* Sántha n. var. on willow; *Heppia* (Sect. *Solorinaria*) *Hungarica* Sántha n. sp.; and *Lecanora saxicola* f. *glaucescens* Sántha. n. f.—*Istvan Györffy.*

4522. Савич, В. П. [Savich, V. P.] **О новом лишайнике Variolaria kamczatica Savicz sp. nova.** [**A new lichen, Variolaria kamczatica Savich n. sp.**] Ботанические Материалы Института Споровых Растений Главного Ботанического Сада Р. С. Ф. С. Р. [Notulae Systematicae Inst. Crypt. Hort. Bot. Petropolitani] **1:** 10–13. 1922.—In addition to the Russian text a Latin diagnosis is given of *Variolaria kamczatica* n. sp., found on the bark of *Betula, Alnus* and *Salix.—Frederick V. Rand.*

4523. Савич, В. П. [Savich, V. P.] **Лишайники семейства Thamnoliaceae на Камчатке.** [**The lichen family Thamnoliaceae in Kamchatka.**] Ботанические Материалы Института Споровых Растений Главного Ботанического Сада Р. С. Ф. С. Р. [Notulae Systematicae Inst. Crypt. Hort. Bot. Petropolitani] **2:** 47–48. 1923.—In addition to the Russian text a Latin summary is given concerning *Thamnolia vernucularis* (L. fil.) Arch., and its forms *tenuis* Savich n. f. and *taurica* (Wulf.) Schaer.—*Frederick V. Rand.*

4524. Warén, Harry. **Reinkulturen von Flechtengonidien.** [**Pure cultures from lichen gonidia.**] (Dissertation, Helsingfors, 1920.) Ofversigt Finska Vetensk. Soc. Förhandl. **61A**[14]: 1–79. *9 pl., 2 fig.* 1918–1919 [1920].—Gonidia of 21 different species of lichens were isolated by means of capillary glass tubes and cultured in absolutely pure culture. They grew well with inorganic materials as the source of nitrogen, but in general developed better with asparagin, alanin, or glycocoll. On the other hand, peptone had a less favorable effect. The gonidia can not, therefore, be considered as peptone organisms.—*Cystococcus* is divided into 2 sub-genera; **Eucystococcus** n. subgen. (vegetative cell-division with division walls between the daughter cells in the case of autospore formation) and **Eleuterococcus** n. subgen. (typical autospore formation, in which the daughter cells round themselves up entirely within the mother cell). All the species of *Cladonia* which were investigated possess *Eleuterococcus* gonidia. All the species of *Cystococcus* observed in the case of other lichens belong to *Eucystococcus.* Of these, 7 new elementary species were described, which are separated on the appearance of the colonies and their relation to different sources of nitrogen. In addition the following new species of **Hyalococcus** n. gen. (cells irregularly rounded or elongated, with parietal, pale green chromatophore or pyrenoid; increasing, by successive bipartition, to many daughter cells; sporangia with more than 4 autospores, and likewise swarmspores, being

absent; occurring in the case of *Dermatocarpon miniatum*) were described: *Coccomyxa Schmidle* and *Coccobotrys* Chod.—Often each species of lichen appears to consist of a single gonidial species. The various species of *Cladonia* have, on the contrary, gonidia which are very similar or in part identical. Specimens of *Xanthonia parietina* from different parts of Finland all had identical gonidia; on the other hand, a specimen of the same lichen coming from Holland had gonidia which belong to another elementary species.—*R. Collander.*

BACTERIA

4525. Abbott, A. C. **The principles of bacteriology.** *526 p.* J. B. Lippincott Co.: Philadelphia, 1922.

4526. Aujeszky, A. **Általános bakteriologia.** [General bacteriology.] *iv + 251 p. Fig. 1–86.* Kir. magy. Természettudományi Társulat: Budapest, 1924.—This practical handbook will be of interest to an extensive group of readers. The first part treats the general character of the bacteria and bacteriological investigation, part 2 discusses the morphological and part 3 the biological characteristics of bacteria, part 4 their pathogenicity, while part 5 treats of immunity.—*Istvan Györffy.*

4527. Duthie, G. M. **Présence du B. fallax (Weinberg et Seguin) dans la flore de l'appendicite.** [The presence of B. fallax Weinberg and Seguin in the flora of appendicitis.] Compt. Rend. Soc. Biol. **91**: 327–329. 1924.—In 13 cases of appendicitis *B. fallax* was found 3 times. Morphological and physiological characters are given. The agglutinating serum for *B. fallax* is specific and there can be no doubt about the identification. It is the 1st time this anaerobic gangrenous organism has been found in the human intestine.—*Oran Raber.*

4528. Gomes de Faria, J. **Leptospira couvyi chez un malade suspect de dengue.** [Leptospira couvyi in a patient thought to have dengue.] Compt. Rend. Soc. Biol. **90**: 55–56. 1924. —From the blood of a patient whose symptoms were diagnosed as those of dengue an organism of the genus *Leptospira* is described. Since Couvy has described a similar form the name *L. couvyi* is given.—*Oran Raber.*

4529. Hoebel, Hermann. **Ueber die alkoholsäurefesten stabchen des darmes.** [The alcohol acid-fast bacteria of the intestines.] *11 p.* A. G. Haller: Bern, 1922.

4530. Hotchkiss, Margaret. **Bacteriological studies on the Imhoff tanks and sprinkling filter bed (of a sewage disposal plant).** New Jersey Agric. Exp. Sta. Bull. 390. *P. 49–67. Fig. 23–30.* 1923.—This paper presents one phase of a series of studies by various workers on the biology of sewage disposal, results being presented of a survey of the bacteriological population of the Imhoff tanks and filter beds. At intervals during the period from Nov. 1922 to April 1923, samples were taken from various parts of the tank and bed and studied by the dilution method in 11 different media. From each sample, counts were made of the numbers of ammonifiers, gelatin liquefiers, albumin digesters, cellulose decomposers and the H_2S, sulphate, nitrate, nitrite and nitrogen gas producers respectively.—The proteolitic organisms and the nitrogen transformers were found to predominate, the cellulose decomposers being the least abundant. No marked differences were found in bacterial population in the Imhoff tanks and the filter bed, during the period studied. Seasonal fluctuations were noted, especially with the nitrogen transformers,—the nitrogen oxidizers decreasing and the reducers increasing in numbers during the winter months.—Conclusions are withheld awaiting the summer's counts. —*C. M. Haenseler.*

4531. Lieske, Rudolf. **Bakterien und strahlenpilze.** *88 p. 2 pl. 65 fig.* Gebrüder Borntträger: Berlin, 1922.

4532. Martin, Louis, Georges Loiseau, et Victor Gidon. **Production des formes ramifiées du Bacille diphthérique.** [The production of ramifying forms of the diphtheria Bacillus.] Compt. Rend. Soc. Biol. **91**: 332–334. *1 pl.* 1924.—Under the conditions described, an "American Bacillus No. 8" gave long ramifying forms of characteristic toxic properties. Other forms of the diphtheria Bacillus under the same conditions do not give these forms.—Because of the regularity of their development and their good coloration they can not be interpreted as degenerate forms, as many have been.—*Oran Raber.*

4533. Moore, C. G., and W. Partridge. **Bacteriology and parasitology.** *300 p.* W. Wood & Co.: New York, 1922.

4534. Norton, John F., and J. J. Weight. **Aerobic spore forming lactose fermenting organisms and their significance in water analysis.** Amer. Jour. Public Health **14**: 1019–1021. 1924.—A number of strains of spore-forming, lactose-fermenting bacteria were isolated from a number of different sources, including the Chicago water supply. This is a chlorinated water. The organisms in question are believed to be either identical with or closely related to those previously isolated by a number of other workers. The spores were extremely resistant to the action of disinfectants. "The sources from which they have been isolated, and the high resistance of their spores to chemical disinfectants, indicate that they may appear at times in drinking water supplies" even in spite of chlorination. They have little sanitary significance but may cause positive colon presumptive tests. In order to eliminate spurious results it may be necessary to continue the examination according to the standard "completed test." "Our studies indicate that these organisms will appear not infrequently in surface water supplies after a rainy period."—*C. A. Ludwig.*

4535. Potter, Frans de. **La filtrabilité des Bacilles paratuberculeux a travers les bougies Chamberland. [The ability of the para-tuberculosis Bacilli to pass through Chamberland filters.]** Compt. Rend. Soc. Biol. **91**: 922–924. 1924.—Para-tuberculosis Bacilli such as the acid resistant forms of Grassberger and Korn, although morphologically similar to Koch's Bacillus, will not pass through an L^2 Chamberland filter.—*Oran Raber.*

4536. Prévot, A. R. **Diplococcus constellatus (n. sp.).** Compt. Rend. Soc. Biol. **91**: 426–428. 1924.—The physiological and morphological characters are given for this peptolytic, saccharolytic, non-pathogenic organism.—*Oran Raber.*

4537. Vale, H. E. P. **A comparison of the differential media used in the isolation of B. coli in water analysis.** Ann. Rept. Division Sanitary Engineering, Provincial Bd. Health, Ontario, Canada **1923**: 89–92. (Also Ibid., Bull. 11.) [1924].—Characteristics of *Bacillus coli communis* are described and conclusions formed from comparative tests of presumptive and confirmatory media are given.—Enriching media: Lactose broth, lactose bile and safranin broth were compared, using various dilutions of sewage. The colon group was detected and confirmed in greatest dilution in the different media according to the following percentages: Lactose broth, 57; lactose bile broth 1.3; safranin broth 0; lactose broth and bile broth 30; and positive, all three, 12.—*B. coli* could be isolated from 79% of the tubes showing less than 10% of gas in 48 hours. In 45% of cases where the last tube of safranin broth was doubtful (less than 10% gas in 48 hours) and subsequently confirmed, the corresponding tube of lactose broth showed 10% of gas in 48 hours and likewise in 31% of dilutions in which lactose bile was doubtful. From these experiments it is concluded that the use of lactose broth is to be preferred as a preliminary enrichment medium. It is noted that in case of lactose bile, production of gas is at first more rapid than with lactose broth or safranin broth, but in 24 hours gas production is only equal or slightly greater than in lactose broth.—Confirmatory media: Eosin-methylene-blue agar is considered the most suitable medium for confirmations for the following reasons: (1) ease of preparation, (2) permanence, and (3) constancy of composition. Endo's medium, while the most widely used, is not considered suitable, owing to difficulties of preparation and adjustment of reaction. The chief objection to lactose litmus agar lies in the difficulty arising from the necessity of adding the indicator immediately before pouring. Also, the litmus should be prepared every few days and sterilized, as a solution of commercial litmus becomes contaminated in that time if left unsterilized. These difficulties may be overcome by adjusting pH to 7.2 before sterilizing and adding 1% of Andrade's indicator. It has been found in working with this medium that there is less tendency towards inversion of the lactose if sterilization is carried out in the autoclave at 15 pounds pressure for 15 minutes, than if sterilized by the fractional method on 3 successive days in an Arnold sterilizer.—*Rudolph E. Thompson.* (*Public Health Engineering Absts.*)

MYXOMYCETES

4538. Jarocki, Jerzy. **Śluzowce Puszczy Białowieskiej. Częsc I. Śluzowce z Rezerwatu Północnego. [Myxomycetes of the Great Bialowieza Forest. Part I. Myxomycetes from the North Protected Territory.]** Acta Soc. Bot. Poloniae 2: 183–199. 1924.—Eighty species are reported, of which 10 were new to Poland and 1 to Europe.—*C. W. Dodge.*

PALEOBOTANY AND EVOLUTIONARY HISTORY

E. W. Berry, *Editor*

(See also in this issue Entries 4188, 4426)

4539. Bandulska, Helena. **On the cuticles of some recent and fossil Fagaceae.** Jour. Linn. Soc. Bot. London **46**: 427–441. *Pl. 39–40, fig. 1–6.* 1924.—In this paper the cuticular characters of *Nothofagus dombeyi*, *N. betuloides*, *N. antarctica*, *N. solanderi*, *N. fusca*, *N. moorei*, *N. menziesii*, *N. cunninghami* and *N. blairii* are described. They agree in having isodiametric stomata in definite groups. The stomata have strongly cuticularized poral rims frequently accompanied by cuticular thickening at the junctions of the guard cells, and by a horizontal strip of cutin at the poles of their long axes. Epidermal cell-outlines may be sinuate or straight. These considerations lead to the reference of *Dicotylophyllum stopesae* from the Eocene of Bournemouth, England, to the genus *Nothofagus*, the 1st record of this antipodean genus in the Northern Hemisphere. In the genus *Fagus*, cuticular characters are described for *Fagus sylvatica*, *F. engleriana*, *F. grandifolia*, *F. orientalis*, *F. sieboldii* and *F. sinensis*. *Fagus* and *Nothofagus* form a continuous series, but in *Fagus* the stomata are somewhat flattened at the poles, the guard cells are less cuticularized, their line of junction is usually delicate, and there is no dagger-shaped piece of cutin except in *F. grandifolia*. *Fagus bournensis* is described as new from the Eocene of Bournemouth.—*E. W. Berry.*

4540. Berry, E. W. **American Tertiary terrestrial plants and their interdigitation with marine deposits.** Bull. Geol. Soc. Amer. **35**: 767–784. 1925.—In this paper the character and correlation of the various plant-bearing horizons of southeastern North America are discussed, and a summary is given of the present state of our knowledge and the probable age of Tertiary plants in Mexico, Costa Rica, Panama, Colombia, Venezuela, Trinidad, Antigua, Porto Rico, Haiti, Jamaica and Cuba.—*Author.*

4541. Cockerell, T. D. A. **Fossils in the Ondai Sair Formation, Mongolia.** Bull. Amer. Mus. Nat. Hist. **51**: 129–144. *Pl. 1, 2.* 1924.—This paper is mainly devoted to fossil insects, although fishes, estherias and a few plant fragments are discussed. The latter are identified as *Baiera furcata*, *Phyllocladites* (?) *morrisi* n. sp., and *Czekanowskia* sp. There is an extended discussion of the age of this biota with the conclusion that it is late Jurassic or early Cretaceous.—*E. W. Berry.*

4542. Erdtman, O. G. E. **Mitteilungen über einige irische Moore.** [On some Irish bogs.] Svensk Bot. Tidskr. **18**: 451–459. *3 fig.* 1924.—Bogs from 3 different parts of Ireland (Portarlington, neighborhood of Caragh Lake and Killarney in county Kerry and Connamara) were investigated by the pollen-analytical method, some results being illustrated in pollen diagrams. The diagrams show that the common pine must have had a wide distribution in Ireland, probably simultaneous with the boreal pine-era in Sweden, when the tree was also common in Scotland.—*O. Heilborn.*

4543. Erdtman, O. G. E. **Studies in micro-palaeontology I–IV.** Geol. Fören. Stockholm Förhandl. **46**: 676–681. 1924.—These studies contain a brief account of pollen analyses of peat from the Dogger Bank, Brittany, Chatham Islands and the Otago district of New Zealand. In the 1st, pine predominates, birch is scarce and hazel rare. The 2nd contains pollen of birch, alder, oak, pine, elm, lime and *Rhamnus* and spores of *Polypodium* and *Tilletia*, that of the alder dominating. That from the Chatham Islands contains *Coprosma?*, predominating, and *Dacrydium* and *Podocarpus*. Conifers no longer exist on the islands and the pollen must either have been brought by the wind from New Zealand, which is 700 km. distant, or they must formerly have existed on the islands.—*E. W. Berry.*

4544. E[rdtman], O. G. E. [Rev. of: Felix, J. **Leitfossilien aus dem Pflanzen- und Tierreich in systematischer Anordnung.** (Plant and animal fossils systematically arranged.) *vii + 228 p. 566 fig.* Wilhelm Engelmann: Leipzig, 1924 (see this issue, Entry 4546).] Svensk Bot. Tidskr. **18**: 520. 1924.

4545. E[rdtman], O. G. E. [Rev. of: Lämmermayr, E. **Die entwicklung der Buchenassoziation seit dem Tertiär.** (Evolution of beech association since the tertiary period.) Fedde's Repertorium Spec. Nov. Regni Veg., Beihefte, Bd. 24. *100 p.* 1923.] Svensk Bot. Tidskr. **18**: 520–521. 1924.

4546. Felix, Johannes. **Leitfossilien aus dem Pflanzen- und Tierrich in systematischen Anordnung.** [Plant and animal fossils systematically arranged.] *2nd ed. 228 p. 566 fig.* Wilhelm Engelmann: Leipzig, 1924.—This work gives a clear and excellent repertorium on paleontology. Different conditions under which fossils are to be found and formed are described in the general introduction. The 1st part of the book contains the principle fossil plants, systematically arranged, whereas the 2nd part considers the fossil animals. The last part of the work gives in tabular form the different periods and formations, the formation divisions and the characteristic representatives of their flora and fauna. (See also this issue, Entry 4544.)—*J. C. Th. Uphof.*

4547. Fritel, P. H. **Contribution à l'étude des flores tertiaires d'après les materiaux du Muséum d'Histoire naturelle. III–IV.** [Contribution to the study of tertiary floras based on material in the Muséum of Natural History.] Bull. Mus. Hist. Nat. [Paris] **27**: 471–476. 1921.—III. Aquitanian flora of Oropos, Greece:—The combined studies of Gaudry, Unger and Saporta of the Tertiary flora of Oropos, Greece, have yielded 8 species. The author, working on museum material collected at Oropos by De Saporta, increases this number to 35. The gymnosperms included are *Widdringtonia Kumiensis* Sap., *Glyptostrobus europaeus* Heer., *Sequoia Tournali* Sap., and *Pinus holothana* Ung.; the preponderating angiosperm groups are Fagaceae, Myricaceae, Lauraceae, and Leguminosae. In addition to the list of species, nomenclatorial and distributional information is given for a few of the forms. The general conclusions reached are that these deposits are closely related to those of Coumi, and that the actual number of genera and species making up this association is less than formerly supposed.—IV. The presence of *Nipadites Burtini* Brong in the Ypresian from the Southwest of France:—The existence of this plant at Gan is based upon 2 fruits collected from Ypresian layers. Distributed in different Eocene levels in Belgium, it has been hitherto known in France only from the Lutetian of Noirmoutiers and the Paris Basin.—*John M. Fogg, Jr.*

4548. Groves, James, and G. R. Bullock-Webster. **A sketch of the geological history of the Charophyta.**] Reprinted from vol. 2, British Charophyta. *P. 72–90. 24 fig.* 1924.—This succinct account discusses the presence of charophyte remains as fossils, with illustrations, lists of species according to horizons, and a bibliography. According to the author's view the oldest definite remains of this type of plant consist in a species of *Palaeochara* from the Carboniferous. There are numerous species in the Jurassic and later Mesozoic, and still more numerous species in the Cenozoic.—*E. W. Berry.*

4549. Heard, A., and R. Davies. **The Old Red Sandstone of the Cardiff District.** Quart. Jour. Geol. Soc. London **80**: 489–519. 1924.—On page 493 of this paper describing the Devonian of the Cardiff district in Wales, the genus *Pachytheca* and much comminuted vegetable matter in association with fish remains, are described.—*E. W. Berry.*

4550. Hollick, Arthur. **A new fossil species of Hydrangea.** Bull. Torrey Bot. Club **52**: 21–22. *Pl. 2.* 1925.—The author describes what appear to be 3-sepaled sterile flowers and traces of fertile flowers of a new species of *Hydrangea*, *H. alaskana*, from a Tertiary shaly sandstone at Jaw Mountain, Alaska peninsula.—*E. W. Berry.*

4551. Holmsen, Gunnar. **Vore myrers plante-daekke og torvarter.** [The vegetation and peat species of our moors.] Norg. Geol. Unders. **99**: 1–160. 1923.—This is an elaborate study of the peats of Norway, in Norwegian with German summary. An admirable account is given of the methods of study and of the plant constituents of the different types of peat. There are no true fossil species recorded, but the work is of great interest to students of Pleistocene plants.—*E. W. Berry.*

4552. Jeffrey, E. C. **Resin canals in the evolution of the conifers.** Proc. Nation. Acad. Sci. [U. S.] **11**: 101–105. *Fig. 4.* 1925.—This is a restatement of the author's well known belief in traumatic atavism.—*E. W. Berry.*

4553. Jeffrey, E. C. **The origin of parenchyma in geological time.** Proc. Nation. Acad. Sci. [U. S.] **11**: 106–110. *Fig. 5.* 1925.—The author regards wood parenchyma as derived from tracheids in post Paleozoic time, appearing first at the end of the summer wood and later becoming diffused through the seasonal ring. In the concluding sentences of the article the author claims [in opposition to the generally accepted view] that Paleozoic Gymnosperms were equally without annual rings and wood parenchyma, and that annual rings are the result of progressive refrigeration of the globe in later geological times.—*E. W. Berry.*

4554. Kozlowska, Aniela. **Flora międzylodowcowa z pod Rakowa. [The interglacial flora near Rakow.]** Acta Soc. Bot. Poloniae **1**: 213–232. *Pl. 5.* 1923 [1924].—The author lists 29 species from the glacial deposits at the junction of the Kiedronka and the Czarna near Rakow. Remains of *Tsuga canadensis* appear to be the most noteworthy.—*C. W. Dodge.*

4555. Leclercq, Suzanne. **Observations nouvelles sur la structure anatomique de quelques végétaux du Houiller belge. [New observations on the anatomy of fossil plants from the Carboniferous of Belgium.]** Bull. Cl. Sci. Acad. Roy. Belgique **10**: 352–354. 1924.—This paper describes the anatomy of the petiole of *Botryopteris Fraiponti* and of the stem of *Sphenophyllum Gilkinetti*, both new species from calcareous nodules contained in the coal seams of Wérister, Belgium.—*E. W. Berry.*

4556. Nichols, George Elwood. **The terrestrial environment in its relation to plant life.** (In: Nichols, George Elwood, et al. **Organic adaptation to environment.** *xviii + 312 p. Pl. 1–7, fig. 1–34.*) *P. 1–43.* Yale Univ. Press: New Haven, 1924.—This introductory chapter of a book devoted to adaptation and environment is given to a consideration of the environment, especially from the standpoint of the plant. Environmental agencies are discussed physiologically under moisture, temperature, light and chemical conditions; and ecologically under climatic, physiographic, biotic and pyric conditions. In discussing the way in which the environmental complex acts the author stresses limiting factors as opposed to optimum factors, especially what is called the law of minimum and the law of maximum, and Bancroft's law or the law of compensating factors. He is sure that environment determines whether variations shall be perpetuated but is doubtful if environment has any part in variation.—*E. W. Berry.*

4557. Ravenel, Mazÿck P. **Evolution and preventive medicine.** Amer. Jour. Public Health **14**: 1016–1019. 1924.

4558. Seward, A. C., and R. E. Holttum. **Tertiary plants from Mull.** Mem. Geol. Survey Scotland. *P. 67–90* (Chapter 4). *Pl. 2, fig. 5–15.* 1924.—The authors record the following plants from the lower part of the volcanic series on the Island of Mull. The age is thought to be Eocene: *Equisetum Campbelli* Forbes, *Onoclea hebridica* (Forbes), *Ginkgo adiantoides* (Unger), *Pinites* sp., *Cupressites MacHenryi* Bailey, *Sequoites* (?) *Langsdorfi* (Brongn.), *Podocarpus Campbelli* Gardner, *Pagiophyllum Sternbergi* (Goepp.), *Elatocladus Campbelli* (Forbes), *Cupressinoxylon* sp., *Corylites hebridica* n. sp., Dicotyledonous wood (Betulaceae), *Quercus greenlandica* Heer, *Platanus hebridica* (Forbes), *Phyllites platania* (Heer), *P. ardtunensis* n. sp., *Phyllites* sp., and 6 unnamed fragments.—*E. W. Berry.*

4559. Wieland, George R. **Fossil plants as evidence for resistance to environment.** (In: Nichols, George Elwood, et al. **Organic adaptation to environment.** *xviii + 312 p. Pl. 1–7, fig. 1–34.*) Yale Univ. Press: New Haven, *P. 149–185.* 1924.—The author appears to have original ideas as to how adaptation and environment are related. He emphasizes the antiquity of the main plant types and the scarcity of extinct ordinal types, and appears to favor the idea of the independent origin rather than the normal radiation of similar types. Much of the chapter is devoted to a discussion of the possible number of ancient species and their duration in time, concluding that about 100,000 years is a fair average. Entirely unproved estimates of the duration of geological time are made the basis for a variety of speculations cast in mathematical form, of which the following sample will indicate their measure of validity: $S = \left(\frac{1+a}{2}\right) n$. "If there were 12,000 Devonian species and if 100 mutations is a fair average for post Devonian change into present plant life then the sum total of plant species for the past 300,000,000 years would be a little over 10 million." The proof is $10{,}200{,}000 = \left(\frac{192{,}000+12{,}000}{2}\right) 100$.—*E. W. Berry.*

4560. Wright, W. B. **Age and origin of the Lough Neagh clays.** Quart. Jour. Geol. Soc. London **80**: 477–478. 1924.—This paper discusses the age of the Lough Neagh clays of northern Ireland. Fossil plants found in the boring at Washing Bay represent *Sequoia couttsiae, Dewalquea hibernica, D. fraxinifolia* and *D. denticulata* Johnson & Gilmore, and wood described as *Taxodioxylon* which probably represents *Sequoia.* The age is considered as probably Oligocene.—*E. W. Berry.*

PATHOLOGY

Frederick V. Rand, *Editor*

Lillian C. Cash and Harry Braun, *Associate Editors*

(See also in this issue Entries 4016, 4020, 4034, 4035, 4040, 4059, 4061, 4066, 4077, 4078, 4082, 4088, 4097, 4110, 4172, 4180, 4182, 4232, 4256, 4258, 4270, 4272, 4275, 4293, 4303, 4362, 4371, 4383, 4397, 4429, 4480, 4489, 4491, 4492, 4497, 4499, 4503, 4511, 4557, 4698, 4724, 4728, 4783, 4784, 4785, 4794, 4795, 4799, 4800, 4814, 4815, 4817, 4821)

DISEASES CAUSED BY FUNGI

4561. Anonymous. **A new efficient fungicide.** Amer. Fertilizer. 61[4]: 62–64. 1924.—Complete protection from both apple scab and blotch was afforded by a weak concentration of colloidal copper hydroxide (0.019%). This spray produced very little burning—much less than 3:4:50 Bordeaux and little more than lime sulphur.—*George H. Dungan.*

4562. Alcock, N. L. **A dieback, and bark disease of willows attacking the young trees.** Trans. Roy. Scottish Aboric. Soc. 38: 128–130. 1924.—The disease is due to *Fusicladium saliciperdum* which causes black blotches on the stem and an extensve dieback. It attacks many species of willows and has been noted in Bavaria and other parts of Germany, in Denmark, and recently in the Netherlands. At first, dark blotches appear on the leaves, covered with a velvety pile, the dark olive-colored area contrasting sharply with the green of the healthy leaf. Conidia developing on these spots start new infections on other leaves. The spores are carried or blown to the tender tips of young shoots and, infecting the soft tissue, cause a dieback, the shoot turning black, the tip sometimes curling into a hook as in Monilia tip-wilt of plum. The parasite spreads over the leaf and travels down the mid-rib and petiole to the leaf-base, and infects the cortex of the stem at its juncture with the leaf, spreading above and below. Measures of control are cutting out diseased twigs as far as possible during the winter and burning before spores are formed in the spring. A winter wash of copper sulphate—4 pounds $CuSO_4$ to 100 gallons H_2O—may be tried in the spring.—*Lillian C. Cash.*

4563. Ampelos. **Podredumbre de las raices en la viña.** [Vine root rot.] Información Agric. [Madrid] 13: 341–344. 1923.—Root rot of the vine is said to be due to several fungi which are able to attack when cultural conditions for the host are unfavorable. Control measures are given, including ditching and removal of diseased plants to prevent spread.—*John A. Stevenson.*

4564. Anderson, P. J. **Controlling onion smut with kalimat.** Phytopathology 14: 569–574. 1924.—In the formaldehyde treatment for onion smut [*Urocystis cepulae* Frost] the author has found that the usually recommended concentrations cause serious injury to the seed if the soil of the seedbed is comparatively dry at the time of seeding. For this reason a substitute for formaldehyde is very desirable, and the value of a number of chemicals has been investigated. Of those tried, Kalimat was the only one proving as effective as formaldehyde for control of onion smut; it caused little or no injury to germination in dry soil where the stand was ruined by similar treatment with formaldehyde. The greatest objection to the treatment is the high cost of Kalimat.—*B. B. Higgins.*

4565. Badoux, H. **Le Cenangium Abietis Duby, un nouveau champignon parasitaire de l'épicéa.** [Cenangium abietis Duby, a new parasitic fungus of the spruce (Picea).] Jour. Forest. Suisse 73: 101–104. 1922.—Normally a harmless saprophyte found on the branches of several conifers, this fungus may change to a dangerous parasite attacking trees of all ages. A historic résumé describes the damage caused by *Cenangium abietis.* In 1921 the parasite made its 1st known attack on spruce in a stand 60 years old. The biological description is followed by that of the control measure adopted. The infested area was cut clean and surrounded experimentally by a heavily thinned isolation belt.—*G. Kempff.*

4566. Beauverie, J. **Sur la germination des urédospores des rouilles du blé.** [Germination of the uredospores of wheat rust.] Compt. Rend. Acad. Sci. Paris 179: 993–996. 1924.—*Puccinia graminis* and *P. triticina* were studied. It was found that the spores germinate best in the latter part of summer. The optimum temperature is about 20°C. They were found

to germinate best on the surface of water and when not immersed. Their germ tubes display negative hydrotropism. This indicates that entrance into the stomates is due to positive chemotaxis. Spores were germinated in sodium chloride in concentrations from 0.0% to 1%. In the stronger concentrations the germ tubes were shorter after a given interval had elapsed. No germination was observed in saturated solutions. With $CuSO_4$ solutions 20% germination is secured in 0.01%, 5% in 0.1%, and it is rare in 1%. In formalin germination was obtained in 0.0083%, but no germination in 0.1% to 0.055%; it is regarded as the best disinfectant for red rust.—*C. H. Farr.*

4567. Bewley, W. F., and J. Shearn. **A root disease of the tomato caused by Colletotrichum tabificum (Hallier pro parte) Pethybridge.** Ann. Appl. Biol. 11: 244–251. *Pl. 5–6.* 1924.—The symptoms and morbid anatomy of a root disease of tomato are described. Inoculation experiments proving the pathogenicity of the causal fungus are also reported. These experiments indicate that infection takes place in the soil and that primary infection of aerial parts rarely, if ever, occurs. The abundant production of sclerotia, which are liberally provided with black setae, is characteristic of the pathogene. During 3 years' observation no organized conidial structures were found and the fungus was described in a previous note as *Sclerotium setosum* Bewley & Shearn. Later *Colletotrichum* spores appeared in an old culture on cellulose agar. It was thereafter identified as *Colletotrichum tabificum* (Hallier pro parte) Pethybridge, which Pethybridge and the authors consider identical with *Rhizoctonia tabifica* Hallier. As a result of further cultural and inoculation studies, the authors also concluded that their fungus was identical with *Vermicularia varians* Ducomet. They also note its resemblance to *Colletotrichum solanicolum* O'Gara and consider it possibly the same.—*A. W. Henry.*

4568. Bisby, G. R. **The Sclerotinia disease of sunflowers and other plants.** Sci. Agric. 4: 381–384. *Pl. 1.* 1924.—*Sclerotinia sclerotiorum* (Lib.) Massee is shown to be capable of attacking sunflowers, carrots, parsnips and a number of other vegetables. Studies in the fusion of hyphae tend to indicate that *S. trifoliorum* may yet prove to be a synonym of this fungus.—*T. G. Major.*

4569. Boyce, J. S. **An unusual infection of Polyporus schweinitzii Fr.** Phytopathology 14: 588. 1924.—A cluster of sporophores and local infection of heart wood was found at a knot 51 feet from the ground on a living tree of Douglas fir (*Pseudotsuga taxifolia* (Lam.) Br.).—*B. B. Higgins.*

4570. Bruyn, Helena L. G. de. **The Phytophthora disease on lilac.** Phytopath. 14: 503–517. *Fig. 1–6.* 1924.—Epidemics of *Phytophthora syringae* Kleb. on the lilac have been observed in Aalsmeer in the spring of years following abnormal rainfall during the previous August and September. Much harm is done to the plants which have been prepared for forcing from January to March. The disease was found on the leaves as well as the buds and branches. Sporangia occurred on both sides of the leaf. Growing tissue causes the death of the fungus so that it can exist in the buds and stems only during the dormant season. Wounding was found to be necessary for cortex infection. It is also thought unlikely that bud infection occurs. The infected leaves usually fall prematurely and the fungus seldom reaches the stem through the petiole. However, under special conditions it does reach the stem and lives over in the leaf trace until the growing season is past. In December the fungus in the leaf trace becomes active and finally reaches the buds from the inside. If the forcing begins before January the progress of the fungus will be stopped. Hand picking of the infected leaves is the only recommendation made, this being necessary only for lilacs to be forced after December.—*Naomi Chapman.*

4571. Dodge, B. O., and Neil E. Stevens. **The Rhizoctonia brown rot and other fruit rots of strawberries.** Jour. Agric. Res. 28: 643–648. *Pl. 1–3.* 1924.—A fruit rot of strawberries found to be important in central Florida is caused by a fungus which in its mycelial characters resembles *Rhizoctonia solani* Kühn as commonly found on cultivated plants. When the berry is first attacked by this fungus the cells of the invaded tissues become somewhat hypertrophied. Later the cells of the decaying tissues gradually collapse and the mycelium of the fungus which is at first intercellular becomes both inter- and intracellular. The "hard brown rot" caused by this Rhizoctonia is characterized by the fact that it regularly

starts on the under side of the berry, advances slowly and shows a definite line of demarcation between the brown decayed portion and the normal uninfected pulp. In addition the berry is often distorted or "one-sided" in shape and particles of soil usually adhere tightly to the affected area. The "tan rot" caused by *Pezizella lythri* is confined to a somewhat cone-shaped region, the base of which appears as a tan-colored, slightly sunken spot on the side of the berry. This rotted portion may readily be separated almost intact from the sound tissue. The leather rot, caused by a species of *Phytophthora* is easily distinguished, if the fruit is cut open, by the fact that the vascular tissue becomes markedly discolored being a much deeper brown than the affected pulp. Berries rotted by this fungus are very bitter to the taste. The Botrytis or grey mold rot is not localized in any part of the berry as the fungus grows readily in all tissues. Berries affected by *Botrytis* are brown and rather tough without either the marked vascular discoloration or localized decay which are characteristic of one or more of the other brown rots discussed in this paper.—*Authors' summary.*

4572. Faris, James A. **Physiological specialization of Ustilago hordei.** Phytopathology 14: 537–557. *Fig. 1.* 1924.—In work previously reported (see Bot. Absts. 13, Entry 7841) some results indicated biologic specialization. In the present work direct experimental tests have shown 5 distinct physiological races which may be differentiated by their ability to infect certain species of barley. Form I infects Hannschen and Summit, Form II infects Nepal, Form III infects Summit, Form IV infects Texas Winter, and Form V infects Hannschen, Summit, and Nepal. This relation between the physiological races and host varieties has held constant under field conditions and on various substrata in the greenhouse. Preliminary tests with more than 100 varieties of barley inoculated with smut spores collected in various parts of the country indicate the existence of other races of this fungus. Data obtained by planting infected seed at 7-day intervals throughout the fall indicate that environmental conditions in New York become more favorable for infection from early in September until late in October. After the latter date infection is inhibited by low soil temperature. Dehulling, either by hand or by close threshing, allows much greater smut infection and also reduces germination and growth of barley seed. High percentage of infection was obtained over a wide range of soil moisture. Results indicate that environmental conditions subsequent to infection may influence the amount of smut developed.—*B. B. Higgins.*

4573. Farr, Clifford H. **Cellular interaction between host and parasite.** Phytopathology 14: 575–579. *Fig. 1–12.* 1924.—With a specially constructed damp chamber the author was able to use the microscope in observing mycelium of *Fusarium lycopersici* growing in contact with root hairs of tomato seedlings. No penetration of the root hairs by the fungous hyphae was observed.—*B. B. Higgins.*

4574. Frank, Arthur. **The mushroom root rot.** Bi-Monthly Bull. Western Washington Exp. Sta. 9: 83–84. *1 fig.* 1922.—This records the trouble caused by *Armillaria mellea* on various hosts and recommends treatment.—*F. D. Heald.*

4575. Fraser, W. P., and P. M. Simmonds. **Co-operative experiments with copper carbonate dust and other substances for smut control in 1923.** Sci. Agric. 4: 257–263. 1924.—Copper carbonate dust at the rate of 2–3 ounces per bushel gives effective control for bunt or stinking smut [(*Tilletia tritici*) of wheat when the seed is not very heavily smutted. Each kernel must be thoroughly covered with the dust by means of a special machine for the purpose. Monohydrated copper sulphate and calcium carbonate in equal proportions as a dust appear to give satisfactory results. Sulphur may be of value where the seed is only slightly smutted. Copper carbonate dust is the most effective treatment for smutted hull-less oats. Semesan and chlorophol may be of value where the soil is infected with fungi, although the soaking method of treatment is troublesome with large quantities of seed.—*T. G. Major.*

4576. Guba, E. F. **Pathological histology of apple blotch.** Phytopathology 14: 558–568. *Pl. 30–31, fig. 1–5.* 1924.—The account given is based largely on the gross structure of tissues in cankered areas (produced by *Phyllosticta solitaria* E. & E.) as revealed in stained microscopic sections. Cankers on twigs, leaf petioles, leaf blades and fruits were sectioned, stained and studied to determine the changes in structure of the host tissues initiated by the invading fungous hyphae. Infection and early stages of canker development were not studied because of the difficulty of obtaining viable spores of the parasite.—*B. B. Higgins.*

4577. Hartley, Carl. **De ziekten van de cacao. [The diseases of cacao.]** Dept. Landb. Nijverheid en Handel Inst. Plantenziek. Bull. [Dutch East Indies] 19. *1–15.* 1924.—The most important cacao diseases are discussed for the benefit of the Java planter, including a summary of the author's investigations, the details of which are reserved for technical publication.—Two local pod diseases are discussed: pod rot (*Phytophthora faberi*) and a minor trouble characterized by a slow blackening of the pods affecting only the outermost tissues of the shell, the cause of which is unknown. The fruit petrification associated with *krulloten* disease, of South America, and watery rot (*Monilia*) and black spot decay (*Sphaeronema*) of Ecuador, are not known in Java.—Canker (*P. faberi*) now causes less serious loss in Java than that reported in other countries because of its peculiar tendency to spread generally in the outer bark layers. In the hybrid stands which constitute the greater portion of the plantings in Java, this is attributed partly to natural mass selection, the most susceptible trees having been killed out in sick plantations before reaching the age of 10 years. Spores are produced mainly on pod lesions, but the source of inoculum for canker outbreaks observed in absence of pod rot is difficult to explain except on the theory of soil infestation or substitute hosts. Inoculation experiments demonstrated that the fungus could attack both bark and fruits of randoe (*Ceiba pentandra*), papaya, and *Hevea* and the bark of nutmeg and "dadap" (*Erythrina*), although the first 2 and the last are rarely infected in nature. Extensive cross-inoculations with cultures from various sources indicated some host specialization of the fungus, shown by greater aggressiveness of each strain on the particular host from which it was isolated in nature. However, sufficient exceptions were noted to make it unsafe to ignore other hosts as sources of cacao infection.—For control, aside from general sanitation and care with respect to light and growing conditions the excision of diseased tissues is recommended only for the occasional deep cankers which reach to the cambium. For new planting, the selection of resistant material, seed, or scions from healthy mature trees which may occur in badly diseased areas is advised.—Die-back (*Diplodia cacaoicola*), root-rot, and trunk rot are of minor importance in Java; the first 2 are usually controlled by proper attention to shade, fertilization, and sanitation.—*R. D. Rands.*

4578. Heald, F. D., and L. J. Smith. **The dusting of wheat for bunt or stinking smut.** Washington [State] Agric. Exp. Sta. Bull. 168. *1–15. Fig. 1–5.* 1922.—This is a brief historical statement of the use of copper carbonate dust, followed by the results obtained in comparative treatments of wheat with copper carbonate, formaldehyde, bluestone, chlorophol and sulphur. Copper carbonate at the rate of 2 ounces per bushel was completely effective on spring seedings. No injury resulted even though the wheat was stored for months. A smut-treating machine for the application of the copper carbonate, as designed and built in the Farm Engineering laboratory, is described and illustrated.—*F. D. Heald.*

4579. Heald, F. D., and L. J. Smith. **The dusting of wheat for bunt or stinking smut.** Washington [State] Agric. Exp. Sta. Bull. 171. *1–28. Fig. 1–5.* 1922.—This is a revision of Bull. 168 (see preceding entry) to include the results of 1922. The additional data give the results with different amounts of copper carbonate per bushel, tests with different quantities of anhydrous bluestone and calcium carbonate, and also tests of Corona compound and Seed-o-san, in spring wheat and the comparative effect of copper carbonate and various other seed treatments in preventing bunt in winter wheat planted in ordinary summer fallow. Control of bunt in spring wheat was not perfect except in lightly smutted seed, the maximum for heavily smutted seed being 5.41% of smutted heads. For winter wheat the control with copper carbonate was nearly equal to that obtained by bluestone and superior to that obtained with formaldehyde. The germination tests of treated grain (copper carbonate) showed that wheat could be treated for months before seeding without injury.—*F. D. Heald.*

4580. Joshi, S. D. **The wilt disease of safflower.** Mem. Agric. Dept. India, Bot. Ser. **13:** 39–46. *Pl. 1–3.* 1924.—The disease of safflower (*Carthamus tinctorius*) was first observed at Pusa in the winter of 1920 when the crop was badly affected at flowering time. Later it was also found at Sankni. At Pusa the damage reached as much as 30% in some varieties, practically all of which were affected. The disease was first noticed only when a large number of mature plants began to show sudden wilting. The wilted plants have a dense, white growth of mycelium at the base, and large, black sclerotia are produced just below the soil level on

the surface of the crown and roots. In the diseased crop at Pusa an apparently healthy plant showed a little yellowing of the leaves and the whole plant dried up. The cortical tissue in the lower part of the stem came off in shreds. In advanced cases the flower heads broke off their stalks readily leaving an outer involucre of bracts, a condition found to be due to the development of a large, black, pear-shaped sclerotium in the thalamus of the flower, changing it to a powdery mass. The causal organism was found to be *Sclerotinia sclerotiorum*, identical with *Rhizoctonia napi* West. Low temperature and abundant moisture are very favorable to the growth of the fungus. The sclerotia do not seem to live longer than a little over 1 year. They are killed by immersion in water at 50°C. for 5 minutes. The practicable control measures are collection and destruction of infective material, deep ploughing and clean weeding.—*Lillian C. Cash.*

4581. Klebahn, H. **Infectionsversuche mit Taphrina Tosquinetii. [Infection experiments with Taphrina Tosquinetii.]** Ber. Deutsch. Bot. Ges. **41**: 108–113. *Fig. 1–5.* 1923.—The author found that in pure cultures of Salep agar, *Taphrina Tosquinetii* forms only yeast-like shoots. These are capable of infection. The infection in the alder takes place in the bud. The infection may occur in fall, spring or summer but only if the conidia reach special places on the young leaf "Anlage." The fungus may spread over the leaf or over several leaves, though at times it is limited to small areas. It may in certain cases over-winter in the plant.—*Hally Jolivette Sax.*

4582. Leach, J. G. **The parasitism of Colletotrichum lindemuthianum.** Minnesota Agric. Exp. Sta. Tech. Bull. 14. *1–41. 8 pl., 6 fig.* 1923.—A study of parasitic capabilities of 15 cultures of *Colletotrichum lindemuthianum* demonstrated the existence of 8 distinct biologic forms which could be distinguished only by their behavior on certain differential hosts. No morphological or cultural differences were detected. The cardinal temperatures for growth were the same for the 3 different biologic forms tested (0°, 22.5° and 32°–34°C). The organism grew best on alkaline media. A "double optimum" was evident, both optima being on the alkaline side. All efforts to modify the parasitic capabilities of the biologic forms gave negative results. Spores germinated poorly in distilled or tap water or Czapek's solution but germinated well when bits of fresh bean tissue were added. Penetration of the epidermal cells of bean stems was accomplished by mechanical means and equally well on resistant and susceptible hosts. The development or lack of development of the mycelium in susceptible and resistant hosts was observed and described both from freshly cut living material and stained sections. In young tissue of susceptible hosts it may penetrate numerous cells without apparent injury to the host protoplast. Cell-wall penetration at first is mostly by mechanical means but later the cell walls are softened. In older tissue of susceptible hosts the mycelium is unable to penetrate the cell walls and soon disintegrates. As soon as this occurs the cell contents are stained brown. In highly resistant hosts the mycelium penetrates only 1 or 2 cells before it begins to disintegrate, with the same detrimental effect on the host protoplast. The failure of the mycelium to develop in a resistant host is interpreted as the result of its inability to obtain nourishment, and the death of the host is thought to be due to the effects of the products of autolysis of the fungous mycelium.—*Author.*

4583. Lesley, J. W., and Michael Shapovolov. **Dodging wilt with resistant tomatoes.** Pacific Rural Press **109**: 39. 1925.—A description is given of Fusarium wilt with its optimum conditions of development. Results of tests of resistant varieties show that while the Stone variety is perhaps the most susceptible to this disease, a selection from the Stone, called the Norton or Resistant Stone has been remarkably resistant and has produced a satisfactory crop on heavily infected soil. A selection from Norton showed greater resistance the past season and a selection from the Stone made in California in 1922 has proved about equal to Norton in resistance. Results with several other varieties are indicated.—*C. S. Pomeroy.*

4584. Mackie, William W., and Ruth F. Allen. **The resistance of oat varieties to stem rust.** Jour. Agric. Res. **28**: 705–719. *Pl. 1–2, fig. 1.* 1924.—Two hundred and seventeen varieties of oats, were tested in green-house and field (1920) for their resistance to oat stem rust, *Puccinia graminis avenae* Erikss. & Henn. The list of oats included lots of *Avena brevis* Roth., *A. fatua* L., *A. nuda* L., *A. sativa* L., *A. sativa orientalis* L., *A. sterilis L.*, and *A. strigosa* Schreb. The rust used was collected in the botanical garden in Berkeley, California. The

great majority of the varieties proved fully susceptible to the rust. The resistant varieties, all of which belong to *Avena sativa* L. and its subspecies *A. sativa orientalis* L., are as follows: Green Russian, Richland, Rüakura, Snoma, and White Tartar (White Russian). In 1 or 2 other lots the seed were mixed and contained a resistant strain. Collections of oat stem rust were made from 9 oat-growing districts in California in 1920 and kept growing in isolated cultures in the greenhouse. About 40 varieties of oats, including representatives of each species of oats, and including all the resistant varieties, were inoculated in the greenhouse with each of these rusts in 1920 and again in 1921. With 1 doubtful exception, the varieties resistant to the Berkeley rust proved resistant to rust obained elsewhere in the state; the rest were uniformly susceptible. No conclusive evidence was obtained of distinct physiological races of the rust within the state.—*Ruth F. Allen.*

4585. Marchionatto, Juan B. **El Fusarium roseum Lk. y su presencia en la Phalaris bulbosa. [Fusarium roseum Lk. and its presence on P. bulbosa.]** Bol. Agric. Provincia de Buenos Aires 3⁷: 12–14. 1922.—*Fusarium roseum,* considered to be the conidial stage of *Gibberella saubinetii* (Mont.) Sacc., was commonly found attacking *Phalaris bulbosa,* a promising new forage grass in Argentina. A pink fungous layer forms on the spikes.—*John A. Stevenson.*

4586. Möbius, M. **Über das Grauwerden des Holzes. [The origin of grey color in wood.]** Ber. Deutsch. Bot. Ges. **42**: 15–18. *1 fig.* 1924.—The grey color of weathered wood was found to be due to brown fungous spores in the surface-cells of the wood.—*Karl Sax.*

4587. Newton, R., and W. R. Brown. **Is the apparent winter-killing of sweet clover and red clover a result of disease injury?** Sci. Agric. **5**: 93–96. *Pl. 1–4.* 1924.—Preliminary experiments indicate that *Sclerotinia sp.* is the cause of the injury to sweet clover previously supposed to be winter-killing. In the case of red clover the fungus may be an important contributing factor but other factors are apparently concerned. Further investigation is required.—*T. G. Major.*

4588. Noble, Robert J. **Studies on the parasitism of Urocystis tritici Koern., the organism causing Flag-smut of wheat.** Jour. Agric. Res. **27**: 451–490. *3 pl., 2 fig.* 1924.—Observations were made on the reaction of the pathogene to its environment and its relationships within the host. The spores do not germinate readily. A maturation period was previously considered essential but spores which had been extracted from unopened sori of infected leaves germinated readily after having been dried over sulphuric acid for 48 hours at 18°–22°C.—Uninjured seedlings of wheat and of various non-susceptible plants stimulated the germination of spores which had been presoaked in water almost as readily as did the addition of portions of cut plant tissue. This fact is probably correlated with the epidemiology of the disease under Australian conditions, and indicates a possible method of reducing the amount of viable inoculum between successive crops of wheat.—Plant tissue decoctions at concentrations 1 part to 10,000 stimulated germination of presoaked spores. The effective constituents of the decoctions were volatile at low temperatures. In arbitrary tests many volatile oils also stimulated spore germination. Benzaldehyde, 3 parts in 2,000,000 and butyric acid 1 part in 500,000 distilled water were the most useful solutions in the series tested.—Presoaking apparently resulted in increased permeability of the spore envelope. The stimulatory agents apparently increased permeability of the protoplasmic spore contents. Spore germination was not correlated with any changes in surface tension of media as measured against air. Since many chemical types—aldehydes, ketones, organic acids, alcohols—were effective, it was considered that the action on the protoplasm was largely physical and changed the phase of the colloidal contents from a gel to a hydrosol.—Similar treatment stimulated germination of other spore forms, for example, teliospores of *Puccinia graminis tritici.*—The spores germinated in potassium phosphate solutions from pH 3.6 to pH 7.1. Optimum germination occurred between pH 5.1 and pH 5.7. Spores were exposed to relative humidities ranging from 0 to 100% at a series of temperatures ranging from 5 to 26.5°C. Relative humidities from 50 to 75% favored longevity of the spores. The spores after exposure to medium relative humidities also germinated more readily than did those in the other series of the test.—Soil temperatures ranging from 14 to 21°C. were optimum for infection. The most severe and earliest recorded lesions appeared 29 days after inoculation. Some plants were infected at 5°C. and some at

23–25°C. No plants were infected at 29–31°C. Inoculation at 15°C. and transfer after 6 days to temperatures above 23°C. resulted in a decreased amount of infection.—A few germinating spores frequently caused severe infections, while heavy inoculation with dry spores often failed to do so. Conditions favoring secondary shoot development favored development of the disease.—The nucleus of the spore divides at germination, a single nucleus usually migrating to each sporidium. When the latter germinated, the nucleus divided and a binucleated germ tube resulted. Fusion of sporidia was rarely observed. In such cases migration of 1 of the sporidial nuclei resulted in production of the binucleate condition. The sporidia are considered as structures which are intermediate in type between sporidia of *Tilletia* sp. and that of an undifferentiated mycelium.—The mycelium in the plant is intercellular and hasutoria-like bodies were observed. Hyphal fusions occurred prior to spore formation. More frequently, 2 hyphae were involved in formation of the spore balls, spores and sterile cells arising simultaneously.—Infection hyphae were observed to enter the epidermal cells of rye seedlings but no further development occurred.—*Author.*

4589. Overeem, C. van. **Ueber Ustulina vulgaris Tul. und U. zonata (Lév.) Sacc.** [**Ustulina vulgaris Tul. and U. zonata (Lév.) Sacc.**] Bull. Jard. Bot. Buitenzorg III. **6**: 256–263. 1924.—The author discusses these 2 species of *Ustulina* and comes to the conclusion that they are conspecific and that the correct name for this species is *U. maxima* (Weber) von Wettstein. A detailed description of the species, which causes a disease on the trunk of Hevea, is given and a bibliography concludes the article.—*Alfred Rehder.*

4590. Palm, B. T., and S. C. J. Jochems. **A disease on Amarantus, caused by Choanephora cucurbitarum (B. & Rav.) Thaxter.** Phytopathology **14**: 490–494. *Pl. 28.* 1924.—In Sumatra, *Choanephora Cucurbitarum* has been found to cause a new disease on *Amarantus Blitum* L., an introduced weed which is used as a substitute for *Spinacia oleracea* L. and *Portulaca oleracea* L. The disease causes a sharp bend at 5–10 cm. from the top of the stem which is blackened each way from this point. Conidia develop at night or early in the morning. Wounding seems to facilitate infection which takes place easily through the under side of the leaf, the upper surface apparently being resistant. Well developed sporangiophores were found in older infections, the conidial stage appearing first. The morphology of the organism as found on *Amarantus* has led the author to believe that a comparative cultural study would be valuable in clearing up any doubt as to the species-characters that are now accepted for the genus *Chonaephora.*—*Naomi Chapman.*

4591. Paulson, R. **Fungi and birch trees.** Jour. Quekett Microsc. Club 2nd Ser. **15**: 42–45. 1923.—A discussion is given of the killing of birch trees in the Epping Forest by *Melanconis stilbostoma* which had previously been considered a saprophyte. Root-investing fungi such as *Amanita muscaria, Boletus scaber* and *Scleroderma vulgare* and their mycorhizal association with birch trees are discussed.—*L. B. Walker.*

4592. Perry, D. C. **Plan governing the conduct of cooperative white pine blister rust control work in the state of Massachusetts.** *17 p.* Mimeographed. Massachusetts Dept. Agric. Div. Plant Pest Control. 1924.—The purpose of the publication is to assemble in 1 statement all reports relating to this plan.—*Lillian C. Cash.*

4593. Poole, R. Frank. **Recent investigations on the control of three important field diseases of sweet potatoes.** New Jersey Agric. Exp. Sta. Bull. 365. *1–39. Fig. 1–10.* 1922.—The author reports results of studies on the control of Yellows or stem rot of sweet potatoes due to *Fusarium batatatis* and *Fusarium hyperoxysporium,* ground rot, "pit" or "pox" due to *Cystospora batatas* and scurf or soil stain due to *Monilochaetes infuscans.* In his studies of stem rot the writer states that this disease, which is the cause of serious losses in South Jersey, is disseminated largely by diseased potatoes. For the control of stem rot it is recommended that only resistant varieties be planted. The Yellow Jersey was found to be very susceptible, the Red Jersey and Gold Skin varieties less so, and the Porto Rico and Dooley varieties of southern yams, highly resistant. It is also suggested that attention be given to the selection and treatment of seed and to hot-bed management. For the control of ground rot it is suggested that inoculated sulphur be broadcast at the rate of 300–400 pounds per acre about 1 month before planting. The use of amounts of nitrogen larger than usual is also advised. For the control of scurf or soil stain, both uninoculated and inoculated sulphur greatly re-

duced the amount of infection. For the control of this disease it is recommended that only clean potatoes be used for seed and that inoculated sulphur be broadcast as recommended for the control of ground rot or "pox."—*Wm. H. Martin.*

4594. Poole, R. F[rank]. The stem rot of sweet potatoes, losses, sources of infection and control. New Jersey Agric. Exp. Sta. Bull. 401. *1–32. Fig. 1–12.* 1924.—Studies of losses, sources of infection, and varietal and strain resistance are reported. Losses amounting to 20 and 30% reduction of the crop occurred in 1922 and 1923 respectively. The soils in many fields were severely infected with *Fusarium batatatis* and *Fusarium hyperoxysporium.* The soil was the greatest source of infection, but infected seed and plant beds were other sources. The Dahomey, Red Brazil, White Yam and Triumph varieties were not killed by the disease in infected soils, where a very high percentage of the Jersey varieties were killed. Some special selections, or sport strains, of Jersey varieties were more resistant to the disease than others. The Porto Rico, Nancy Hall, and Dooley varieties were only slightly resistant to stem rot. The White Yam, Red Brazil, and Triumph varieties were more productive of marketable potatoes than the other resistant varieties used, and it is recommended that these varieties be grown on the severely infected soils. However, on severely infected deep sandy soils they may not yield well, and in this case, it is suggested that grasses, alfalfa, corn, asparagus, melons, tomatoes, peaches, apples, or other crops may be grown successfully. On soils where death from stem-rot does not exceed 15%, certified seed of the more resistant strains of Jersey varieties may be used.—*Author.*

4595. Quanjer, H. M. **Endothia parasitica.** Phytopathology **14**: 535. 1924.—A careful search of the region at Bruges, Belgium, where Haven Metcalf reported finding this fungus has failed to disclose another specimen.—*B. B. Higgins.*

4596. Reilly, G. E. **Saprophytic fungi.** Cyprus Agric. Jour. **19**: 95–97. 1924.—When trees are badly pruned, and where no attempt is made to paint over raw wounds, saprophytic fungi may infect the wound, provided conditions are favorable. The fungus, *Ceratostomella pilifera*, was found on timber from the Famagusta District. This fungus attacks coniferous timbers, while *Chlorosplenium aeruginosum* attacks hardwood species. On some dead acacia wood at Boghaz the author found a species of the genus *Stereum.* A species of the genus *Poria* was also found at the same place. Descriptions and preventive measures are given.—*W. Stuart.*

4597. Rhoads, Arthur S. **Ripe rots of grapes and the acetates of copper and non-staining sprays for late applications to control them.** Proc. Florida State Hort. Soc. **1924**: 154–159. 1924.—White rot (*Coniothyrium diplodiella*) and bitter rot (*Melanconium fuligineum*) are the most important diseases because they often attack the stem of the cluster, its branches, or even the stalks of the berries before the berries themselves are attacked. Control measures for the prevention of these diseases are difficult on account of the mature condition of the fruit at the time of infection. An application of Bordeaux mixture made close to the harvest season mars the appearance of the fruit and renders it unsaleable. Some of the cuprammonium sprays or Burgundy mixture form spots on the foliage. The acetates of copper form less conspicuous deposits and are less injurious. Basic acetate of copper (1–4 pounds to 50 gallons of water) proved an excellent fungicide where it is desired to make late spray applications for the control of black rot and various ripe rots without marring the appearance of the fruit. When gelatin is added to increase the adhesiveness, which is always required when the neutral acetate is used and which is decidedly advantageous even when the basic acetate is used, the formula is: Water 47 gallons, basic acetate of copper 2 pounds and stock solution of gelatin (4 ounces to 1 gallon) 1 gallon.—*J. C. Th. Uphof.*

4598. Roberts, John W., and John C. Dunegan. **The fungus causing the common brown rot of fruits in America.** Jour. Agric. Res. **28**: 955–960. *Pl. 1–2.* 1924.—By examination of type specimens it is shown that *Sclerotinia fructicola* (Winter) Rehm, described by Winter in 1883 under the name of *Ciboria fructicola*, is identical with the ascogenous stage of the common American brown-rot fungus. If it is assumed that the American fungus is different from the European form commonly known as *Sclerotinia cinerea* (Bon.) Schröter, then its name should be *Sclerotinia fructicola* (Winter) Rehm, the 1st name known to be applied to any stage of it and also the 1st name applied to the ascogenous stage. If the American form

and the European are considered identical then the name should be either *Sclerotinia cinerea*, if one believes the 1st known name properly applied to any stage should be adopted as the correct one, or S. *fructicola*, if it is believed that the 1st known name properly applied to the ascogenous stage should be considered as the correct one. The known differences between the 2 forms are chiefly physiological as revealed by differences in growth on artificial media and are not considered sufficiently great to warrant considering the 2 forms as separate species. The name *Sclerotinia cinerea* (Bon.) Schröter is preferred by the authors.—*B. O. Dodge.*

4599. Schmidt, E. W. **Die fungizide Wirkung von Seifenlösungen. [The fungicidal effect of soap solutions.]** Ber. Deutsch. Bot. Ges. **42**: 131–135. *Fig. 1.* 1924.—A series of experiments show that the effect of soap solutions on *Botrytis cinerea* is the gradual production of oleic acid in the spore or hyphae. The small globules of oleic acid fuse, forming a large globule, with the probable tearing of the delicate protoplasm surrounding the globules. Even if this accumulation of fat does not always lead to the death of the organism, it inhibits the normal physiological activities, reducing the organism from a facultative parasite of great destructiveness to a harmless saprophyte. *Monilia* and *Fusicladium* are affected in the same way when treated with soap solutions.—*Hally Jolivette Sax.*

4600. Stone, R. E. **Preliminary investigations on the root-rot and blight of canning peas.** Sci. Agric. **4**: 239–241. *2 fig.* 1924.—The root-rot and blight of canning peas has assumed serious proportions in the eastern sections of Ontario. The disease is characterized by a rapid wilting a short time after germination of the seed. The rootlets are destroyed, and there is a blackened area at the ground level. *Fusarium vasinfectum* var. *pisi* Hall and *Pythium debaryanum* Hesse have been shown to be the joint pathogens. Crop rotation has not given satisfactory results as a control measure. A number of strains showing a promising degree of resistance have developed but further work will be necessary.—*T. G. Major.*

4601. Tisdale, W. H., and V. F. Tapke. **Infection of barley by Ustilago nuda through seed inoculation.** Jour. Agric. Res. **29**: 263–284. *Pl. 1–9.* 1924.—Floral infection of barley by the loose smut organism has been accepted as the only means of infection by this fungus. In investigations in the greenhouse at Arlington Farm (Rosslyn, Virginia) dehulled seed of Han River, Tenessee Winter, Wisconsin Winter, Greece, Alaska and Texas Winter barleys inoculated with spores of *Ustilago nuda*, produced plants with high percentages of loose smut, but Nakano Wase remained smut-free even though the seed were de hulled and smutted. Seedlings from dehulled inoculated seed of all varieties studied were severely injured and many failed to emerge. Seedlings from dehulled inoculated seed sown ¾ of an inch deep emerged in higher percentages than those from similar seed sown 1½ inches deep. Seedlings from inoculated seed with the hulls not removed were not noticeably injured but some of the plants produced smutty heads. Spores of *U. nuda* devitalized by pasturization were not harmful to seedlings grown from the inoculated seed. Neither viable nor devitalized spores of *U. nuda* were harmful to seed of Red Wave wheat grown from inoculated seed.—A microscopic study revealed infection of the coleoptile and 1st leaves of the plumule of seedlings of both the susceptible varieties and the resistant variety, Nakano Wase, by *U. nuda.*—*W. H. Tisdale.*

4602. Toro, Rafael A. **Studies on banana anthracnose.** Jour. Dept. Agric. Porto Rico **6**[4]: 3–23. *Pl. 1–4, fig. 1.* 1922 [1924].—Banana anthracnose is caused by *Gloeosporium musarum* Cooke & Massee. The disease is characterized by the formation of sunken, dark blotches on the peel of ripe fruits accompanied by salmon colored spore masses. There is a great variation in the size of the spores of the fungus on different varieties of bananas, even when inoculated from the same culture. The culture media influenced the size of spores of the fungus. Different biologic forms were not influenced in the same manner by the same medium. The variations in size due to the influence of the culture medium were sometimes greater and sometimes less than the difference in size of the 2 forms on the same medium. Therefore, the influence of the medium, so far as spore size is concerned, is of no practical importance in separating biologic forms of *Gloeosporium musarum.* The behavior of the different forms of the fungus in culture media, however, furnished a more definite clue to separation between them. Of all the cultures made from a great number of diseased fruits, 11 showed characteristic points of such marked difference as to justify their separation on the basis of their growth

on culture media. With this fungus, the physiological reaction on the culture medium is of more taxonomic importance than the morphological character of the spores. In addition to ripe bananas, cowpeas, mangoes, avocados and guavas are attacked by the fungus. The fungus mycelium contains a substance capable of dissolving the parenchyma tissue of fully matured bananas, but which has no effect on unripened bananas, nor on the epidermal cells of either mature or immature fruits. The susceptibility or resistance of bananas to the disease is not dependent on the tannin content of the peel. It is therefore possible that mechanical injury accompanied by a change in the chemical composition of the peel, thus increasing the sugar content, is the prevailing factor causing susceptibility to the disease.—*George H. Dungan.*

4603. Villedieu, G., and Mme. Villedieu. **De l'action des solutions de sulfate de cuivre sur le mildiou.** [The action of copper sulphate solutions on mildew.] Compt. Rend. Acad. Sci. Paris 179: 1345–1348. 1924.—It is found that extremely dilute solutions of $CuSO_4$ such as those used by Millardet for a study of the toxic action of this salt on *Plasmopora viticola*, were in reality only the precipitated suspensions of basic copper sulphate.—*C. H. Farr.*

4604. Winston, J. R. **Commercial control of citrus melanose in Florida 1923.** Proc. Florida State Hort. Soc. 1924: 127–129. 1924.—Experimental tests have indicated consistently that melanose infection could be successfully prevented by a single application of Bordeaux mixture provided the spraying was completed before the May rains. Usually a slight amount of fruit infection develops in March of each year and a little more takes place in April, but for the most part general infection of commercial importance does not occur until May. Of 52 sprayed orange and grapefruit groves, 59% of the fruit was commercially free from the disease, whereas the unsprayed groves had only 2% commercially free. Other examples are given. Home made Bordeaux mixture plus standard oil-emulsions gave better results than did the commercially prepared Bordeaux plus the same emulsions. Where the commercial product was used in amounts sufficiently great to make a 3-3-50 dilution the commercial product gave about as good results as did the home-made Bordeaux.—*J. C. Th. Uphof.*

DISEASES CAUSED BY BACTERIA

4605. Berridge, Emily M. **The influence of hydrogen-ion concentration on the growth of certain bacterial plant parasites and saprophytes.** Ann. Appl. Biol. 11: 73–85. *Fig. 1–3.* 1924.—The points of maximum agglutination, the acid limits of growth and the changes in hydrogen-ion concentration accompanying growth were determined for 28 species of bacteria, 14 of which were parasites. The results obtained were discussed in relation to the acidity of the cell sap of plants. No consistent direct correlations were found, although certain parasitic species possessed physiological capabilities such as rapid production of alkali from nitrogenous material which would probably make them more efficient plant parasites. On the other hand, certain non-parasitic species not only do not possess this ability but produce acid and are also agglutinated at a relatively low hydrogen-ion concentration.—*J. G. Leach.*

4606. Fawcett, H. S., W. T. Horne, and A. F. Camp. **Citrus blast and black pit.** California Citrograph 6: 234. *3 fig.* 1921.—Recent field studies confirm earlier conclusions that citrus blast and citrus black pit are 2 effects caused by the same organism (*Bacillus citriputeale*). Blast infections start almost invariably in injuries, are favored by long periods of moist, fairly cool weather during winter and early spring and cease after periods of bright, warmer weather. Spraying with Bordeaux mixture or ammoniacal copper carbonate early in the fall greatly lessened blast infections during the succeeding winter. The absence of citrus blast and infrequency of citrus black pit in southern California are ascribed to the lack of proper combinations of temperature, moisture and leaf or fruit injuries.—*C. S. Pomeroy.*

4607. Girola, Carlos D. **Agallas de corona del duraznero.** [Peach crown gall.] Bol. Agric. Provincia Buenos Aires 3^8: 5–7. *1 fig.* 1922.—This article gives a description of crown gall (*Bacterium tumefaciens*) as it occurs on the peach in Argentina.—*John A. Stevenson.*

4608. Gosset, A., A. Gutmann, G. Lakhovsky, and J. Magrou. **Essais de thérapeutique du "cancer expérimental des plantes."** [Attempts at healing experimental plant cancers.] Compt. Rend. Soc. Biol. 91: 626–628. *2 fig.* 1924.—*Pelargonium zonatum* which had become

cancerous after inoculation with *Bacterium tumefaciens* was cured by treatment with λ waves 2 m. long having a frequency of 150 million per second.—*Oran Raber.*

4609. Hedges, Florence. **A study of bacterial pustule of soybean, and a comparison of Bact. phaseoli sojense Hedges with Bact. phaseoli EFS.** Jour. Agric. Res. **29**: 229–251. *Pl. 1–7.* 1924.—This paper contains a full account of the leafspot of soybean (*Glycine hispida*) produced by *Bacterium phaseoli sojense* Hedges, briefly described by the author in a preliminary paper. The disease is characterized in its early stages by minute pustules and later by irregular reddish-brown spots, often accompanied by conspicuous yellowing. Infection takes place through the stomata. The pustules, which are rarely more than 1 mm. in diameter and due to both hypertrophy and hyperplasia, usually slough off as the spots increase in size. The presence of these pustules and the absence of a water-soaked appearance of the diseased areas render the young infections easily distinguishable from the blight caused by *Bact. glycineum Coerper.* In later stages the 2 diseases are so similar in appearance that only the isolation of the parasite can insure a correct diagnosis. An account is given of inoculation experiments on soybean, velvet bean and several species of *Phaselus* with the soybean organism, and of comparative inoculation studies with this organism and *Bact. phaseoli* EFS. on soybean and Phaseolus. With *Bact. phaseoli sojense*, infection was obtained on soybean, velvet bean (*Stizolobium*) and Lima, string and wax beans of the genus Phaseolus. However, no pustules were produced upon *Stizolobium* or *Phaseolus.* On the contrary, the best infections on *Phaseolus* were not distinguishable from those caused by *Bact. phaseoli* EFS. However, the soybean organism is much less infectious to *Phaseolus* than is *Bact. phaseoli* EFS. An account is given of experiments which indicate that the passage of the soybean organism through *Phaseolus* increases its virulence for the same. *Bact. phaseoli* EFS. is only very weakly pathogenic to soybean. The only good infections obtained were upon the cotyledons of soybean seedlings grown from seed treated with formaldehyde or sulphuric acid, germinated in damp chamber and inoculated by spraying therein immediately after germination. Only once did infection occur in a long series of spray inoculations with *Bact. phaseoli* EFS. on potted soybeans in the hothouse. The infection was very slight and consisted of brown spots or streaks. No pustules were produced. The colonies of *Bact. phaseoli sojense* on beef infusion agar plates are characterized commonly by internal convolutions which have been observed but twice in the innumerable isolations of *Bact. phaseoli* EFS. With this exception the writer has been unable to distinguish the 2 organisms culturally. Comparative cultural studies are reported. This disease is known to occur in Texas, Virginia, Louisiana, South Carolina, Kansas, Delaware and Arkansas. It has been observed on 40 different varieties of soybean in the field.—*Author.*

4610. Hodgson, Robert W. **Lotus persimmon affected by crown gall.** California Cultivator **63**: 293. *1 fig.* 1924.—The lotus persimmon, *Diospyros lotus*, was introduced into this country about 50 years ago but has come into prominence only since the quarantine of foreign-grown nursery stock and the use of the lotus as a root-stock for the Japanese varieties. The reason for the selection of this stock is not altogether clear as no comparative tests have been made to determine the best stock and it is now believed that the lotus is more susceptible than the other species to crow gall.—*C. S. Pomeroy.*

4611. Johnston, T. H., and L. Hitchcok. **A bacteriosis of prickly pear plants (Opuntia spp.).** Trans. and Proc. Roy. Soc. South Australia **47**: 162–164. 1923.—The disease is limited to the parenchyma of the infected segment. Inoculations from cultures on Opuntia decoction caused rapid destruction of the host; inoculations from agar or bouillon failed to cause the disease. Desiccated infected material remained infectious for months. No infection was obtained through uninjured surfaces or through wounds which had dried sufficiently to heal the scar. Insect transfer was found to occur. Cultural reactions are given and the organism is named *Bacillus cacticidus.—Wm. Randolph Taylor.*

4612. Wormald, H. **The mulberry "blight" in Britain.** Ann. Appl. Biol. **11**: 169–174. *Pl. 2.* 1924. The occurrence of mulberry "blight" in Sussex and Kent is reported. It was first noticed by the author in 1914. The pathogene was isolated from leaf lesions and identified as *Bacterium mori* Boyer & Lambert. The disease was found on well established trees on

"stools" and on young trees during the 1st and 2nd years after removal from the stools.—*A. W. Henry.*

DISEASES CAUSED BY ANIMAL PARASITES (INSECTS, NEMAS, PROTOZOANS, ETC.)

4613. Anonymous. **Florida method of boll weevil control.** Amer. Fertilizer 61[8]: 66. 1924.—A poisoned syrup mixture, made by mixing 2 pounds of calcium arsenate in 0.5 gallons of water and then adding 1 gallon of syrup, when mopped in the buds of the cotton plants gave better results than dusting.—*George H. Dungan.*

4614. Docters van Leeuwen, W. **Ein neues Phycocecidium von Niederländisch Ost-Indien.** [A new Phycocecidium from the Dutch East Indies.] Bull. Jard. Bot. Buitenzorg III. 6: 269–272. *Fig. 1–2.* 1924.—The author adds a 3rd to the 2 known species of *Phytophysa* of which 1 is figured. The new species which is found on the leaves of *Laportea decumana* Wedd. is figured and described as *Phytophysa* sp.—*Alfred Rehder.*

4615. Docters van Leeuwen, W. **Some galls of the Malacca Peninsula.** Bull. Jard. Bot. Buitenzorg III. 6: 116–157. *Fig. 1–45.* 1924.—The author describes 84 galls arranged according to the host plants and figures about ½ of them. A bibliography is appended.—*Alfred Rehder.*

4616. Guyton, T. L., and J. R. Stear. **PDB (Paradichlorobenzene) and other controls for the peach tree borer.** Pennsylvania Dept. Agric. Gen. Bull. 383. *1–10. 2 pl.* 1924.—Paradichlorobenzene has given 90 to 100% control for the peach tree borer in Pennsylvania and may be safely used on trees 3 years old or older. The dosage for trees from 3 to 6 years is ½ ounce; for trees 6 years and older, ¾ ounce. The fall is the best time for treatment, the time varying from September 1st to 15th for the northern part and from September 20th to October 10th for the southern part of the State. The grass and weeds should be removed from around the base of the tree and the ground piled up to the height of the highest borer entrance, and made firm and level for a distance of 1 foot. Place PDB in a narrow band about 1–2 inches away from the tree, never against the bark. Cover the chemical by banking up the earth about 5 inches and make firm. The mounds must be removed from young trees promptly after 2 weeks and all mounds must be leveled before the last week of June of the following year. This is necessary to prevent the female moth from placing eggs high on the trunk, which would make subsequent treatments difficult. The cost of treatment per tree is about 3 cents. It is very important to buy pure crystals only.—*Lillian C. Cash.*

4617. Holmes, Francis O. **Geographical distribution of the milk-weed flagellate, Herpetomonas elmassiani (Migone). Its non-pathogenicity in Maryland.** (Abstract) Phytopathology 15: 46. 1925.

4618. Komp, William H. **A study of the distribution of hydrocyanic acid gas in greenhouse fumigation.** New Jersey Agric. Exp. Sta. Bull. 355. *1–22. Fig. 15.* 1921.—The results of studies are reported on the influence of dosage, temperature, moisture, and tightness of the greenhouse on the distribution of HCN gas. The charges were set off in tall earthenware jars placed in a row along the center of each greenhouse. The concentration of HCN gas in different parts of the greenhouse was determined by drawing the HCN-laden air, by means of a rubber tubing, through a dilute solution of NaOH and titrating with $AgNO_3$. An increased dosage resulted in a greater concentration of HCN gas at the top of the greenhouse. A variation of 10° in temperature was found to have little influence on the distribution of HCN gas. A change in relative humidity of 11% had considerable influence on the distribution, an increased concentration accompanying a higher humidity. In all cases where a ⅝ ounce charge was used the greatest concentration and the most complete diffusion was found to occur within 6 minutes after the charge was set off. Concentrations as high as 0.000278 gm. HCN gas per l. of air were often observed over the benches when ⅝ ounce charges were used. This charge is ordinarily used in controlling rose aphis (*Macrosiphum rosae*). Under controlled conditions in the laboratory, the minimum dosage for rose aphis was found to be a concentration of 0.00015–0.0002 gm. HCN gas per l. of air. A quiet atmosphere and a sufficient number of jars are considered essential for an even distribution of the gas.—*J. G. Gaines.*

4619. Ridler, Winifred F. F. **Investigation of the structure of reverted black currants.**

Ann. Appl. Biol. 11: 252–260. *Pl. 7, fig. 1–4.* 1924.—The object of the study was to ascertain if any anatomical differences exist between reverted (as a result of mite infection) and normal plants of *Ribes nigrum* and if so to determine if these be correlated with morphological evidences of the disease. No actual qualitative differences were found. Only quantitative differences were observed such as in the amount of gum present and variations in the amount of wood and medullary ray tissue. A reduction in the amount of wood and consequent increase in medullary ray tissue, together with the production of more gum characterized the reverted plant as compared with the normal. Anatomical differences, however, seemed altogether inadequate to account for the comparatively large morphological changes.—*A. W. Henry.*

4620. Scott, C. E. **Tylenchus dipsaci Kühn on narcissus.** Phytopathology 14: 495–502. *Pl. 29, fig. 1–3.* 1924.—The growing of narcissus bulbs in California is seriously threatened by the bulb nematode, *Tylenchus dipsaci* Kühn. The disease spreads from infected plants during the growing season. Three types of injury are found when the bulbs are allowed to remain in the ground for a period of years: (1) The central bulbs are dead while those nearest on either side are badly dwarfed; (2) the plants show distorted leaves and (3) the leaves are affected by only 1 or 2 specks. A diseased bulb can be detected by the thin brown ring which marks the infested area of the previous season and in which the nematodes are active during storage. These are a source of infection when set in the field. Infection seems to take place through the young leaves as they push through the ground. Control measures recommended consist in destruction of diseased plants in the field and bulb treatment. Treatment of bulbs in hot water at 100°F. for 3 hours has been found the most satisfactory. Tests are being made to determine the time when the treatment will be most effective with the minimum of injury to the bulbs.—*Naomi Chapman.*

4621. Vogrin, V. **Pipa bademova (Anthonomus ornatus Reiche), štetočinac bademova coijeta u Primorjii i Dalmaciji (Način života i obrana). [The almond trunk beetle causing injury to almond blossoms in coastal Croatia and in Dalmatia.]** Croatian with German summary.) Glasnik Hrvatskog Prirodoslovnoga Društva [Zagreb] 33²: 185–193. 1921.—The life history of the pest is exhaustively treated. The control is indirect, through *Parus major*, or direct through: (1) beating off the egg-masses; (2) placing straw around the trees in which the beetles make their winter home and (3) gathering up fallen blossoms.—*I. Pevalek.*

INFECTIOUS CHLOROSES (MOSAIC AND PEACH YELLOWS GROUPS, ETC.)

4622. Atanasoff, D. **Methods of studying degeneration diseases of potato.** Phytopathology 14: 521–533. 1924.—The author discusses the general confusion and lack of understanding which exists between the workers on the degeneration diseases of potato. Methods are described which are designed to reduce the difficulties of excessive cost, chance of error and length of time required by the common 2-year method of study. The suggested methods are sprout infection by aphids and by sprout or tuber grafting, and plant infection by aphids and by plant grafting. The author has been able to increase his supply of infected material by grafting portions of infected tubers on large healthy tubers and incubating for 6–8 weeks at 20°C.—*Naomi Chapman.*

4623. Brandes, E. W. **El rol de la enfermedad del mosaico en limitar los rendimientos de caña. [The role of the mosaic disease in limiting yields of cane.]** Rev. Indust. y Agric. Tucuman 15: 29–33. 1924.—This is a translation and reprint of an article on the mosaic disease situation in Louisiana, originally published in "Facts about sugar."—*John A. Stevenson.*

4624. Bruner, Stephen C. **La enfermedad del mosaico de la caña de azucar. [The mosaic disease of sugar cane.]** Circ. Estac. Exp. Agron. [Cuba] 60. *3–16. 5 pl. (1 col.).* 1923.—The mosaic disease of sugar cane was first reported from Cuba in 1915, but no efforts were made to control or eradicate the disease until some years later. At the present time the disease occurs in practically all parts of the Island and is causing considerable damage. The disease is discussed as to symptoms, damage done, other hosts, insect carriers and control measures.—*John A. Stevenson.*

4625. Cook, Melville T. **Estudios sobre la causa del matizado. [Studies on the cause**

of mosaic.] Rev. Agric. Puerto Rico 13: 373–376. 1924.—The author discusses the group of plant diseases called virus or mosaic diseases with special reference to sugar cane mosaic. The various theories advanced by different workers are reviewed.—*John A. Stevenson.*

4626. Cross, Wm. E. **La importancia de la enfermedad del mosaico en Luisiana.** [**The importance of mosaic disease in Louisiana.**] Rev. Indust. y Agric. Tucuman **15**: 22–28. 1924. —The author in a previous article (Ibid. 13, 1923) attributed the falling off in yields of sugar cane in Louisiana to the mosaic disease. Other workers, particularly the Director of the Louisiana Exp. Sta. and members of the staff have disputed this conclusion. Their papers are reviewed and the theories put forth to explain the acknowledged decline in the sugar industry are discussed. The author is of the opinion that the key to the situation lies in the use of the resistant Javan seedling varieties which have given such excellent results in Tucuman and Spain, where the mosaic disease has eliminated native varieties.—*John A. Stevenson.*

4627. Fawcett, Geo. L. **El mosaico de la caña de azucar.** [**Sugar cane mosaic.**] Rev. Indust. y. Agric. Tucuman **14**: 5–8. *1 fig.* 1923.—The author gives a general discussion of the disease, including symptoms, varietal resistance and control measures.—*John A. Stevenson.*

4628. Frank, Arthur. **Facts regarding the mosaic disease of raspberry and loganberry in Western Washington.** Bi-Monthly Bull. Western Washington Exp. Sta. **12**: 48–51. Fig. *6–8.* 1924.—History, symptoms and effects, method of transmission, and control measures are considered.—*F. D. Heald.*

4629. Frank, Arthur. **Mosaic, a serious disease of potatoes.** Bi-Monthly Bull. Western Washington Exp. Sta **10**: 64. 1922.—This records the occurrence of mosaic in fields of eastern and western Washington.—*F. D. Heald.*

4630. Frank, Arthur. **Selection of disease-free berry plants.** Bi-Monthly Bull. Western Washington Exp. Sta. **10**: 110–111. 1923.—This reports the occurrence in western Washington of 4 types of degeneration diseases: mosaic, leaf-roll, "bluestem" and chlorosis. —*F. D. Heald*

4631. Quanjer, H. M. **Standardizing of degeneration diseases of potato.** Phytopathology 14: 518–520. 1924.—The pure culture method is considered by the author to be a satisfactory means of identifying the various degeneration diseases of potato. The confusion due to the overlapping of symptoms on different varieties may be overcome by transferring to a variety whose behavior toward these diseases is well known. The author maintains an isolated field for this work and has succeeded in getting pure cultures of 7 degeneration diseases.—*Naomi Chapman.*

4632. Whitehead, T. **Potato leaf-roll and degeneration in yield.** Ann. Appl. Biol. **11**: 31–41. 1924.—This is a progress report of experiments with potato leaf-roll. The disease was successfully transmitted by tuber grafting, and the virus in tubers was not killed by steeping the tuber in 1–1000 mercuric chloride for 1¼ hours. Cutting diseased tubers before planting did not affect the yield. The effects of the disease on yield did not appear to be cumulative at Bangor. The proportion of small and seed-size tubers was not affected by leaf-roll. Both soil and aerial transmission is believed to have taken place. Maximum infection in 1921 did not affect the yield in that year. The relation of leaf-roll to seed-potato production is discussed.—*J. G. Leach.*

NON-PARASITIC DISEASES

4633. Anonymous. **Protecting roses from frost injury.** Missouri Bot. Gard. Bull. **12**: 129–132. *Pl. 38.* 1925.—Various methods and materials are suggested for the purpose indicated.—*O. T. Wilson.*

4634. Anonymous. **Smoke injury to roses.** Missouri Bot. Gard. Bull. **12**: 132–133. 1925. —Varieties differ greatly in their response to smoky conditions. A list of resistant varieties is furnished.—*O. T. Wilson.*

4635. Brooks, Charles, and J. S. Cooley. **Oiled paper and other oiled materials in the control of scald on barrel apples.** Jour. Agric. Res. **29**: 129–135. 1924.—Oiled barrels and oiled liners reduced the scald on the outer layers of apples but had little or no effect upon the package as a whole. Oiled straw gave good scald control but punctured the apples and

damaged their general appearance. Shredded oiled paper gave the best results aside from the oiled wrappers and is recommended as the most promising treatment at present available for barrel apples. The distribution and surface exposure of the oiled material is thought to be of even greater importance in scald control than the amount of oil carried.—*Charles Brooks.*

4636. Daly, P. M. **A preliminary report on Jonathan breakdown.** Sci. Agric. 5: 155–165. *Fig. 1–6.* 1925.—As a result of experimental work carried out in 1923 in the Okanagan Valley of British Columbia it has been shown that there is a direct relation between the stage of maturity when the fruit is picked and the percentage of breakdown occurring in storage. The more mature the fruit the greater is the percentage of breakdown. In addition, the breakdown appears in greater quantity as the storage season advances.—There is no relation between breakdown and corky core as far as the causes are concerned.—No definite conclusion can be drawn regarding the influence of irrigation, cultural methods, tree condition, age of tree, etc.—The optimum time of picking for such a season as 1923 is apparently from Sept. 24 to Oct. 12. This optimum is indicated by the appearance of water core in small, oval areas, extending radially around the core.—*T. G. Major.*

4637. Mason, T. G. **Ligneous zonation and die-back in the lime (Citrus medica, var. acida) in the West Indies.** (Reprint from Proc. Roy. Dublin Soc. 17^{31}: 1923.) Notes Bot. School Trinity Coll. Dublin 3: 247–254. *Pl. 13–16, fig. 1.* 1924.—This gives results of an examination of the ligneous zonation in the shoots of lime trees growing in the West Indies. Half of the shoots examined were from trees affected with die-back. Details of structure in the stems are given and it is tentatively concluded that an important factor in causing the dying back of the shoots is rapid and repeated desiccation of the meristem during the dry periods that occur every year. In the terminal meristem this results in the premature loss of the dominance of the apical bud, and its replacement by daughter shoots, which, in turn, suffer the same fate. In the cambium it is followed by the production of tangential parenchyma.—*G. B. Rigg.*

4638. Morris, O. M. **Apple rosette.** Washington [State] Agric. Exp. Sta. Bull. 177. *1–30. Fig. 1–8.* 1923.—This is a study of the geographic distribution, symptoms and effects, etiology and factors influencing the development of the disease and prevention or control. The conclusions are that rosette is a functional or nutritional disorder of apples and pears; that affected trees are very susceptible to winter injury; that the course of the trouble is not materially influenced by the use of fertilizers or of surgical treatment; and that the use of an alfalfa cover crop disked into the soil in either fall or spring generally improves the health of the trees and results in practically complete recovery if the practice is continued for 5 years.—*F. D. Heald.*

4639. Shoemaker, J. S. **Lime sulphur injury.** Sci. Agric. 4: 180–184. 1924.—The writer deals with the subject from the point of view of physiological horticulture. That the injurious substance enters the leaf through the stomata is shown by the fact that the 1st indication of the injury is a slight russetting of the lower surface. When the spray dries on the foliage the injurious substances are the soluble calcium polysulphides. Under certain conditions of sunlight the lime sulphur causes browning of the chlorophyll in the palisade tissues. Depending on thickness of epidermis, pubescence, and looseness of internal structure, the ultraviolet rays of sunlight may become a factor in spray injury. Additional injury may result if the temperature remains above 90°F. for any considerable time. It is possible that the gases, H_2S and SO_2, liberated from the lime sulphur may unite to form sulphurous or sulphuric acid. The minute particles of sulphur present in the spray mixture result in injury to the leaves. These various factors may act independently, in conjunction, or as supplemental to one another.—*T. G. Major.*

DISEASES OF UNKNOWN CAUSE

4640. Laffite, Vicente. **La enfermedad del castaño.** [The chestnut disease.] Información Agric. [Madrid] 13: 268–270. 1923.—The "ink disease" of chestnut has been known since 1842 and is serious in Italy, France, Spain and Portugal. In 1890, trees to an equivalent of 300,000 board feet were destroyed in 1 locality in Spain. Leaves of infected trees turn

yellow, wilt and fall prematurely. Fruit is not formed. Trunks turn black at the base, the bark rots off and a black liquid rich in tannin exudes from trunk and roots. The disease spreads from the original infected tree to those surrounding it. The cause of the disease is uncertain, having been variously attributed to alteration in mycorhizal relations, cultural conditions and fungi. *Melanconis* spp., considered by some workers as parasitic, act as wound parasites only. No remedial measures are known.—*John A. Stevenson.*

GENERAL AND MISCELLANEOUS PATHOLOGICAL LITERATURE

4641. Anonymous. **Annual meeting of the American Phytopathological Society.** Phytopathology **14**: 535–536. 1924.—This is an announcement of the dates and place of the winter meeting for 1924.—*B. B. Higgins.*

4642. Brasie, G. **Sur un échantillon de bacille du rouget conservé 10 ans in vitro. [A Bacillus of hog cholera kept 10 years in vitro.]** Compt. Rend. Soc. Biol. **91**: 520–522. 1924.—A bacillus isolated from the kidney of a hog in 1913 has been cultivated for 10 years. Its virulence has decreased parallel with an increased weakness of the culture and the appearance of long and filamentous forms. It is rare that virulence has been found to change directly with any other character.—*Oran Raber.*

4643. Butler, O. **Chemical, physical and biological properties of Bordeaux mixture.** Indust. and Eng. Chem. **15**: 1039–1041. 1923.

4644. Fawcett, Geo. L. **Enfermedades de la caña de azucar en Tucuman. [Sugar cane diseases in Tucuman.]** Rev. Indust. y Agric. Tucuman **13**: 5-46. *21 fig.* 1922.—The disease known as "El polvillo" causes a rot of terminal buds of plant cane. The active agents of the disease are bacteria. Cultivation and irrigation have no apparent effect on occurrence of the disease. The upper leaves of infected canes turn yellow and die, the tip or bud region rotting often with an accompanying bad odor. The varieties P. O. J. 213 and 234 are very susceptible. The mosaic disease is common and widespread throughout Tucuman, apparently having been present for many years. Symptoms and control measures are discussed. P. O. J. 36 is very resistant, P. O. J. 105, 228 and 234 are intermediate and P. O. J. 213 is only slightly resistant. The varieties Zwinga and Yon Tan San are immune. A common source of loss is in the rotting of seed pieces in the soil. The following fungi were isolated from such material: *Acrostalagmus sacchari* Faw., *A. glaucus* Faw., *Cytospora sacchari* Butl. and *Fusarium* spp. Root diseases are not serious in Tucuman. Minor diseases due to *Melanconium sacchari*, *Leptosphaeria sacchari*, *Phyllosticta sacchari*, *Thielaviopsis paradoxa*, *Bacterium vascularum*, *Colletotrichum falcatum*, *Gnomonia iliau*, *Cercospora vaginae*, *Sclerotium rolfsii*, *Himantia stellifera* and *Helminthosporium sacchari* are briefly described.—*John A. Stevenson.*

4645. Frank, Arthur. **Cherry troubles in western Washington.** Bi-Monthly Bull. Western Washington Exp. Sta. **12**: 69–74. *Fig. 7-8.* 1924.—This is a consideration of prevalent diseases and insect pests, with methods of control.—*F. D. Heald.*

4646. Frank, Arthur. **Diseases and insect pests of raspberries and their control.** Bi-Monthly Bull. Western Washington Exp. Sta. **11**: 79–81. 1923.—This is a discussion of winter injury, cane gall, mosaic, "bluestem," spur blight, rust, mushroom root-rot and fruit rot or moldy berries in western Washington.—*F. D. Heald.*

4647. Frank, Arthur. **Warning against the tree inoculation fake.** Bi-Monthly Bull. Western Washington Exp. Sta. **10**: 111–112. 1923.—This reports analyses of a number of fake tree powders or blight cures. The following are noted as fake remedies: "Thompson's Tree Powder," "Knokolene," "Squassa," and "Miller's Blight Cure."—*F. D. Heald.*

4648. Girola, Carlos D. **Sobre algunas enfermedades de la patata. [Some potato diseases.]** Bol. Agric. Provincia Buenos Aires **3**[8]: 9–13. *2 fig.* 1922.—Potato diseases due to *Rhizoctonia solani* and *Actinomyces scabies* appeared in the vicinity of Buenos Aires in 1920 and 1921. Symptoms of the diseases are given and control measures outlined.—*John A. Stevenson.*

4649. Hooker, H. D. **Colloidal copper as a fungicide.** Indust. and Eng. Chem. **15**: 1177–1178. 1923.—Preliminary experiments indicate that copper hydroxide prepared as a colloid is fungicidal to apple scab and apple blotch in concentrations of 1 part of hydroxide to

5,000 of water. At this concentration it produced very slight burning. It has excellent sticking properties due to its charge and spreads well in dilute solution. It can be used in conjunction with lead arsenate and nicotine sulphate. Although it would be hazardous to estimate the cost of manufacture, it is clear that colloidal copper hydroxide would be less expensive than either Bordeaux or lime-sulphur.—*Henry Schmitz.*

4650. Jablonowski, J. **Barackfáink bajai.** [**Diseases and pests of peach and apricot trees.**] Természettudományi Közlöny [Budapest] **56**[2]: 81–87. 1924.

4651. Johnson, E. C. **Thirty-third annual report, for the fiscal year ended June 30, 1923.** Washington [State] Agric. Exp. Sta. Bull. 180. *1–80.* 1923.—This bulletin reports mainly a continuation of the projects considered in the previous annual report (Bull. 167). (See this issue, Entry 4034.) The following additional features are of interest to botanists: The causes of abnormal fermentation in cider, by P. W. Allen; the study of measurable characteristics of maturing apples, by J. L. St. John; the comparative tests of "Ridit," the new smut-proof hybrid wheat with Turkey and Hybrid 128, by E. G. Schafer; tests on the adhesiveness and effectiveness of different brands of copper carbonate in the control of bunt, the value of anhydrous copper sulphate, nickel carbonate, Dupont Dust No. 1 and Furfural in bunt control, varietal resistance and results of periodic seedings in the studies of foot-rot of wheat,tests on control of oat smut by copper carbonate, new information on Rhizoctonia control and the types of potato virus diseases present in the state, the occurrence of silver leaf (*Stereum purpureum*) as a factor increasing the intensity of winter injury of apples in Eastern Washington, studies on the Fusarium rot of onions from the Walla Walla section, and new plant disease or new hosts for old troubles, by F. D. Heald; the physiological studies on the photoperiodic factor and its influence on varietal adaptability by M. A. McCall; and the study of cranberry diseases and their control by D. J. Crowley.—*F. D. Heald.*

4652. Kaupp, Benjamin Franklyn. **Animal parasites and parasitic diseases.** *4th ed. rev. xvi + 9–250 p. Illus.* A. Eger: Chicago, 1925.

4653. Kelsall, A. **Dusts and dusting in crop pest control.** Sci. Agric. **5**: 37–51. 1924. —Following a brief history of the development of spraying, the writer deals in turn with the present status of dusting and spraying, various types of dusts, comparison of Bordeaux and sulphur, dust adhesion, the mixing of dust, dusting machines, dusting methods, and future developments.—*T. G. Major.*

4654. McDonnell, C. C. **Recent progress in insecticides and fungicides.** Indust. and Eng. Chem. **16**: 1007–1012. 1924.—The chemical composition and manufacture of many insecticides and fungicides is discussed. A list of 132 references is appended.—*Henry Schmitz.*

4655. McKinney, H. H. **A method of increasing the efficiency of filter cylinders.** Phytopathology **14**: 585–586. *Fig. 1.* 1924.—After the liquid is in the filter mantel a glass tube, only slightly larger than the diameter of the filter and fitted with a stop-cock or rubber tube for closing the upper end, is slipped over the filter. By exhausting the air it is then filled with the liquid and closed. In this manner a small amount of liquid may be held so as to cover the entire surface of the filter.—*B. B. Higgins.*

4656. Marchal, E. **Éléments de pathologie végétale appliquée à l'agronomie et à la sylviculture.** *xvi + 312 p. Fig. 1–148.* Jules Duculot: Gembloux, 1925.—The author states that new theories and facts in phytopathology are being accumulated with such extreme rapidity as to render more and more frequent revisions of our literature necessary. Moreover, if the phytopathological problems vary in time they are scarcely less variable in space. Not only does the parasitized flora vary in different parts of the world, but the parasites themselves show local morphological and physiological variations due to the influence of their surroundings. There is, therefore, a real need for a biogeographic study of plant diseases.—In this work the author deals especially with the diseases of agricultural and horticultural plants and with the fruit and forest trees of Belgium, drawing largely from his 30 years' experience as state phytopathologist. Discussion is also given to many of the principal diseases of other lands, including the tropics and especially the Belgian Congo.—Part I deals with parasitic diseases of vegetable origin. After a general discussion of parasitism and parasites, and of the means of disease control, the specific maladies are taken up under the groups due to bacteria, slime-molds, fungi, algae and lichens, phanerogams, and filterable viruses.—The physiological

diseases are taken up in Part II, under the soil, light, temperature, atmosphere, meteorological agents, and loss of organs and tissues.—Part III gives a tabloid presentation by hosts permitting the determination, by external characters, of the more commonly observed diseases of the principal cultivated plants of Belgium.—*Frederick V. Rand.*

4657. Melhus, I. E., J. H. Muncie, and Wm. T. H. Ho. **Measuring water flow interference in certain gall and vascular diseases.** Phytopathology **14**: 580–584. *Fig. 1.* 1924. —The rate of water flow through diseased and through healthy stems under a definite pressure was determined by means of special apparatus described and illustrated. The rate of flow through sections cut from 100 two-year-old apple stems affected with crown gall [*Bacterium tumefaciens* Smith] compared with that of 100 healthy stems showed an average decrease of 30% for the diseased stems. In stems of cabbage plants affected with wilt (*Fusarium conglutinans*) stoppage of water flow was almost complete. This was true also for alfalfa stems affected with a wilt disease.—*B. B. Higgins.*

4658. New Jersey Departments of Entomology, Pathology and Pomology. **Spray calendars for apples and quinces, peaches, pears, plums and cherries, grapes.** New Jersey Agric. Exp. Sta. Circ. 162, 163, 164, 165, 166. 1924.—These supersede circulars 147, 148, 149, 150 and 151.—*Wm. H. Martin.*

4659. Noffray, E. **Dangers des parasites des plantes spontanées.** [**Danger from parasites of adventitious plants.**] Jour. Agric. Pratique N. S. **39**: 77–79. 1923.—(See also Bot. Absts. 14, Entry 1768.)

4660. O'Kane, W. C. **Chemistry in the control of plant enemies.** Indust. and Eng. Chem. **15**: 911–913. 1923.

4661. Quanjer, H. M. **Institutions for phytopathology and economic entomology in Holland.** Phytopathology **14**: 534. 1924.—The separation of the Dutch Phytopathological Service from the "Institut voor Phytopathologie" is reported. The duties of the former are inspection, and advisory and extension work; those of the latter are teaching and research.—*B. B. Higgins.*

4662. Riesle, Roberto. **Los tratamientos contra las enfermedades del nogal.**—[**Treatments for nut diseases.**] Bol. Soc. Agric. Norte [Chile] **13**: 167–172. 1923.—In spite of increased plantings, production of walnuts has shown no increase since 1909. Upon investigation this state of affairs was found to be due to faulty culture, insects and diseases. The most important disease is the blight due to *Pseudomonas juglandis*. Control measures for the disease as well as proper cultural methods are outlined.—*John A. Stevenson.*

4663. Robinson, R. H. **Powdered Bordeaux mixture.** Indust. and Eng. Chem. **15**: 941–942. 1923.—A method is suggested for the preparation of Bordeaux mixture, in which powdered copper sulphate and hydrated lime are used in the dry form, and recommendations are made for the commercial preparation of a dry Bordeaux mixture.—*Henry Schmitz.*

4664. Thom, Charles, H. C. Colson, and L. H. James. **The ripe olive survey of 1924.** Amer. Jour. Public Health **14**: 1029–1034. 1924.—A resurvey of the ripe olive situation by the Bureau of Chemistry of the U. S. A. Dept. of Agric. was made necessary in 1924 by the occurrence in that year of 3 outbreaks of botulism due to eating ripe olives. Examination of over 800 official samples, totalling over 2,900 containers, from 30 states, the District of Columbia, and Porto Rico, and representing 19 different packers showed that spoiled or questionable products were distributed throughout all the brands and in all the regions surveyed. None, however, showed the presence of *B. botulinus*. Examination of 3 olives from the lot which caused one of the outbreaks showed that they had an offensive odor. An experiment with artificially inoculated cans showed that flat cans may be dangerous but the abnormal product could be detected by the odor. Canned ripe olives deteriorate in time; and every can should be dated or marked in some other manner to furnish adequate information to the dealer and consumer to enable them to avoid such unfit products.—*C. A. Ludwig.*

4665. Trias, Alph. **Sur l'association du Bacillus sporogenes avec le Bacillus perfringens.** [**The association of B. sporogenes and B. perfringens.**] Compt. Rend. Soc. Biol. **91**: 519–520. 1924.—When one injects into a guinea pig a mixture of a slightly virulent culture of *B. perfringens* and a slightly pathogenic culture of *B. sporogenes* the virulence of each is increased and the animal quickly dies.—The increase of the virulence of the *B. sporogenes*

due to the association is very temporary. When isolated and injected alone it does not produce a mortal infection.—*Oran Raber.*

4666. Valtis, Jean. **Sur la filtration du Bacille tuberculeux à travers les bougies Chamberland L².** [The filtration of the tubercle bacillus through an L² Chamberland filter.] Compt. Rend. Soc. Biol. 90: 19–21. 1924.—Filtrate of autolysed tuberculosis sputum when injected into guinea pigs gave lung lesions of authentic tubercular character containing Koch's bacillus.—*Oran Raber.*

4667. Weir, James R. [Rev. of: Hosterman, Gustav, und Martin Noack. **Lehrbuch der pilzparasitaren Pflauzeukrankheiten mit besonderer Berucksichtigung der Krankheiten gärtnerischer Kulturgewächse.** [Textbook of plant diseases due to fungus parasites with special reference to horticultural crops.] *271 p. 104 fig.* Paul Parey: Berlin, 1923.] Phytopathology 14: 534–535. 1924.

PHARMACEUTICAL BOTANY AND PHARMACOGNOSY

Heber W. Youngken, *Editor*

E. N. Gathercoal, *Assistant Editor*

(See also in this issue Entries 4038, 4110, 4113, 4140, 4157, 4194, 4259, 4268, 4271, 4494, 4577, 4580, 4735, 4778, 4819)

4668. B[adoux], H. **Sur la toxicité de l'if.** [The toxicity of yew.] [Rev. of: Jatrides, D. **Beiträge zur Kenntnis der Bestandteile von Taxus baccata L, insbesondere über das Taxin.** [The constituents of Taxus baccata L, with special reference to its taxin content.) *70 p.* G. v. Ostheim: Zurich, 1921.] Jour. Forest. Suisse 73: 111–114. 1922.—Extensive historical notes precede the essential part of this paper dealing with analyses of the yew tree for toxicity: the wood, the fruit and the leaves. The wood is absolutely harmless; the berries may cause minor disorders in children; the leaves or needles contain taxin ($C_{37}H_{52}O_{10}N$) —from 0.7 to 1.4% of their dry weight—a poison which reacts on the heart and has proved fatal to man and certain domestic animals.—*G. Kempff.*

4669. Budai, J. **Népies gyógynövények és gyógyeljárások Borsod vármegyében.** [Popular medicinal plants and their uses in Borsod, Hungary.] Herba [Budapest] 7⁸: 309–317. 1924.—This is a valuable compilation on the uses of medicinal plants of Borsod, Hungary. —*Istvan Györffy.*

4670. Congrès International D'Oléiculture. **Compte rendu des travaux du ve Congrès international d'oléiculture.** [Report of the 5th international congress on olive culture.] *337 p. Illus.* M. Mendel: Paris, 1923.

4671. Darvas, F. **Vadontermö hazai festö-növényeink.** [Wild native dye-plants.] Herba. [Budapest] 7¹⁰: 387–393, 429–431, 476–483. 1924.

4672. Fodor, K. **Szükséges-e a paprika állami minösitése?** [Is it necessary to qualify statements pertaining to Paprika?] Herba [Budapest] 7 ⁴⁻⁵: 145–152. 1924.

4673. Gardner, R. **Further notes on the chemistry of the New Zealand flora.** New Zealand Jour. Sci. and Tech. 7: 220–221. 1924.—Further references [see Bot. Absts. 13, Entry 7321] are given to the literature of the subject.—*H. H. Allan.*

4674. Hansen, Albert A. **The poison plant situation in Indiana. I.** Jour. Amer. Vet. Med. Assoc. 65: 774–777. 1924; **II**, Ibid 66: 80–92. 1924; **III**, Ibid 66: 351–362. 1924.— A popular account is given of the poisonous plants of Indiana, citing a number of cases. The plants discussed are *Eupatorium urticaefolium, Cicuta maculata, Xanthium* sp., *Aesculus* sp., *Robinia pseudacacia, Gymnocladus dioica, Quercus* sp., *Bicuculla cucullaria, Delphinium tricorne,* sorghum, *Datura stramonium, Phytolacca decandra, Helenium autumnale, Ornithogalum umbellatum,* with a short list of other suspected plants.—*C. D. Marsh.*

4675. Jong, A. W. K. de. **De aetherische oliën leverende planten van Nederlandisch Oost-Indië en de bereiding van haar olien, door.** [The volatile oil plants of the Dutch East Indies.] Ber. Handelsmus. Kolon. Inst. [Amsterdam] 7. *vii + 183 p. Illus.* 1922.

4676. Lord, E. L., and B. F. Williamson. **The tung oil tree.** *48 p. Illus.* Pepper Printing Co.: Gainesville, Florida, 1924.

4677. M., L. **Les Éruptions D'Origine Florale.** [Eruptions of plant origin.] Nat. Cana-

dien 49: 265–268. 1923.—The writer refers to a "mémoire" published in the Jour. Méd. Bordeaux by M. Dubreuilh, noting severe skin poisoning by flowers and leaves of *Primula obconica*, chrysanthemums, *Thuja occidentalis* and several species of *Rhus*.—*A. H. MacKay.*

4678. Melchior, H. **Über das Vorkommen von Inulin in dei Blättern der Marcgraviaceen. [On the appearance of inulin in the leaves of the Marcgraviaceae.]** Ber. Deutsch. Bot. Ges. 42: 198–204. 1924.

4679. Pammel, L. H. **Bunch flower poisonous.** Amer. Jour. Vet. Med. 19: 519. 1924.—Pammel's "Manual of poisonous plants" is quoted to the effect that bunch flower, *Melanthium virginicum* is poisonous to horses, flies, and crows.—*C. D. Marsh.*

4680. Pammel, L. H. **Coffee bean poisonous.** Amer. Jour. Vet. Med. 19: 519. 1924.—Coffee bean, *Gymnocladus dioica* has long been recognized as poisonous. The poisonous qualities are stated to be in the pulp of the pod, rather than in the seed.—*C. D. Marsh.*

4681. Pammel, L. H. **Ergot in rye.** Amer. Jour. Vet. Med. 19: 518–519. 1924.—Replying to a question about the symptoms of ergot poisoning, statements are quoted from Pammel's Manual and from McNeill.—*C. D. Marsh.*

4682. Pammel, L. H. **Is the bittersweet poisonous?** Amer. Jour. Vet. Med. 19: 413. 1924.—The berries as well as the rest of the plant are not poisonous to the touch. The leaves are poisonous to horses.—*C. D. Marsh.*

4683. Pammel, L. H. **Is the prostrate vervain poisonous?** Amer. Jour. Vet. Med. 19: 519. 1924.—The author describes *Verbena bracteosa* and states that he has never heard of its being poisonous.—*C. D. Marsh.*

4684. Pammel, L. H. **Mucor corymbifer affects the eyes of horses.** Amer. Jour. Vet. Med. 19: 646. 1924.—From Newport, Rhode Island, are reported cases of the eyes of horses being affected by *Mucor corymbifer*. Other cases of the pathological effect of this mold are quoted from the author's "Manual of poisonous plants."—*C. D. Marsh.*

4685. Pammel, L. H. **Spurge.** Amer. Jour. Vet. Med. 19: 380. 1924.—Replying to a correspondent, the author states that *Euphorbia maculata* is poisonous and discusses briefly other Euphorbias.—*C. D. Marsh.*

4686. Pammel, L. H. **Supposed salal poisoning.** Amer. Jour. Vet. Med. 19: 474–475. 1924.—Some sheep feeding upon moldy pea-straw were poisoned. Salal, *Gaultheria shallon*, was present in the pasture, and it seems probable that this was the cause of the trouble.—*C. D. Marsh.*

4687. Pammel, L. H. **Sweet clover bloating.** Amer. Jour. Vet. Med. 19: 646. 1924.—The author reports several cases of bloating of cattle from eating sweet clover.—*C. D. Marsh.*

4688. Pammel, L. H. **Sweet clover injurious.** Amer. Jour. Vet. Med. 19: 561–562. 1924.—Some cows feeding in a sweet clover (*Melilotus*) pasture in South Dakota died. The author states that bloating from sweet clover is not uncommon.—*C. D. Marsh.*

4689. Pammel, L. H. **Sweet flag and blue flag poisonous.** Amer. Jour. Vet. Med. 19: 601–602. 1924.—A correspondent states that a number of cattle were poisoned when grazing on a swamp containing sweet flag and apparently from eating this plant. The author states that *Acorus calamus* is poisonous, and may have been the cause of the trouble.—*C. D. Marsh.*

4690. Pammel, L. H. **The red-berried elder and papaw poisonous.** Amer. Jour. Vet. Med. 19: 600. 1924.—A correspondent stated that he had been injuriously affected by eating the berries of the red-berried elder, *Sambucus racemosa*. He had also been made very sick by eating the kernels of the seed of papaw, *Asimina triloba*.—*C. D. Marsh.*

4691. Rhodes, F. H., and T. T. Ling. **Chinese wood oil.** Indust. and Eng. Chem. 16: 1051–1055. 1924.—Chinese wood oil is obtained from the seed of *Aleurites fordii* and *Aleurites montana*. The geographical distribution of these tree species is given and the methods of extraction of the oil together with its physical and chemical properties are discussed.—*Henry Schmitz.*

4692. Thompson, R. C. **The Assyrian herbal.** *xxvii + 294 p.* Luzac & Co.: London, 1924.—This is a monograph on the Assyrian vegetable drugs, the subject matter of which was communicated in a paper to the Royal Society, March 20, 1924.—*H. W. Youngken.*

4693. Zunz, Edgard. **Observations complémentaires a propos de l'action de l'ergotamine sur la pupille chez le chien. [Supplementary observations on the action of ergotamine on the pupil of the dog.]** Compt. Rend. Soc. Biol. 91: 392–393. 1924.

PHYSIOLOGY

B. M. Duggar, *Editor*
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(See also in this issue Entries 4012, 4016, 4023, 4037, 4055, 4086, 4087, 4088, 4090, 4097, 4103, 4144, 4147, 4159, 4163, 4166, 4172, 4256, 4280, 4281, 4282, 4291, 4387, 4388, 4411, 4417, 4439, 4447, 4452, 4505, 4556, 4566, 4582, 4588, 4599, 4603, 4605, 4639, 4642, 4651, 4665, 4678)

GENERAL

4694. Belar, Karl. [Rev. of: Pringsheim, E. G. **Zur Physiologie farblosen Flagellaten (Polytoma, Astasia und Chilomonas).** (**On the physiology of colorless flagellates.**) Beiträge Allg. Bot. **2**: (?) 1921.] Arch. Protistenk. **44**: 145–148. 1921.

4695. Bertrand, G. **La réforme de la nomenclature de chimie biologique. [Reform of the nomenclature of biological chemistry.]** Bull. Soc. Chim. Biol. 6: 905–906. 1924.—This is a report presented to the Société de Chimie Biologique on Nov. 4, 1924, of the results agreed upon by a committee appointed at the Fifth Conference for Pure and Applied Chemistry held at Copenhagen in June, 1924. These results are: (1) The glucides are divided into 2 groups; (a) glucoses, which are nonhydrolyzable reducing sugars; and (b) a group to be definitely named by the Sixth Conference, made up of those substances which, on complete hydrolysis, yield 1 or more reducing sugars, with or without other substances. (2) In the case of highly complex or imperfectly known compounds, the name given should be chosen to accord with the most important chemical characteristic. (3) The designation *ine* should be employed only for substances containing basic nitrogen, and may be written *in* or *ine*. (4) Names of glucosides shall terminate in *oside*. In old names, the termination *ine* shall be replaced by *oside*, as salicoside, arbutoside, amygdaloside, in lieu of salicin, arbutin, amygdalin. (5) Names of lipides shall terminate in *ide*, which shall replace the termination *ine*, as trioleide, stearide, palmitide instead of triolein, stearin, palmitin. (6) The study of the nomenclature of the proteins and enzymes will be reported, with that of some other questions, to the Sixth Conference.—*Joseph S. Caldwell.*

4696. Freundlich, H. **Kapillarchemie. [Colloid chemistry.]** *3rd ed. xv + 1225 p.* Akademische Verlagsgesellschaft: Leipzig, 1923.

4697. Höber, Rudolf. **Physikalische Chemie der Zelle und der Gewebe. [Physical chemistry of cells and tissues.]** 5th ed. 1 Hälfte, *xv + 544 p. 81 fig.* 1922; 2 Hälfte, *v + 545–906 + xi + xvi p. 26 fig.* Wilhelm Englemann: Leipzig, 1924.—In this edition the author has endeavored to separate still more completely the purely physical chemistry from the physiology.—Part I takes up the physical chemistry of homogeneous and heterogeneous systems with application to physiology, and discusses the theory of solutions and of the osmotic relations of body fluids, electrolytic dissociation, quantitative determination of H-ions and their physiological significance, surface boundary phenomena, colloids, and reaction velocity as influenced by enzymatic action.—Part II comprises the physical chemistry of cells and of tissues, and takes up the osmotic characteristics and permeability of cells and tissues, dispersion and adsorption in pharmacological actions, the physiological actions of electrolytes on cells and tissues, electrical phenomena at physiological boundary surfaces; resorption, lymph formation and secretion; and the physical chemistry of changes in material and energy.—*Frederick V. Rand.*

4698. Jackson, C. M. **The effects of inanition and malnutrition upon growth and structure.** *xii + 616 p. 117 fig.* P. Blakiston's Son & Co.: Philadelphia, 1925.—"Inanition (withholding or decreasing the normal diet or one or more of its essential elements) is . . . a subject of both theoretical and practical importance to scientific workers in various fields—to biologists (both zoologists and botanists), who are concerned with the fundamental characters of living organisms; to anatomists, who are interested in the problems of morphogenesis; to physiologists and biochemists, working in the various fields of human and animal nutrition; to pathologists, since inanition is one of the primary factors in pathogenesis; and to physicians, . . ."—This work includes "not only the results published by the author and his coworkers

during a decade in this field, together with a considerable amount of unpublished material, but also a comprehensive review of the widely scattered data in the literature concerning the morphological effects of inanition in all living organisms. . . . Especial care has been taken to make the bibliography as complete and accurate as possible. . . ."—Part I (p. 1–66) takes up the effects of inanition on plants, protozoa, and higher invertebrates.—Part II (p. 67–456) discusses the effects on vertebrates, including the body as a whole, and its various organs and tissues.—Part III comprises the author's conclusions, tables, a bibliography of 108 pages, and an index.—"Nutrition . . . is a factor of primary importance for morphology as well as for physiology. . . . Not only the somatoplasm, but under certain circumstances even the germ plasm may perhaps be essentially modified by nutritional conditions, a possibility of fundamental significance for heredity and evolution.—*Frederick V. Rand.*

4699. Vernadsky, W. **Sur la reprèsentation de la composition chimique de la matière vivante.** [**The representation of the chemical composition of living matter.**] Compt. Rend. Acad. Sci. Paris **179**: 1215–1217. 1924.—This is in part a discussion of the elements present in the primary, metamorphosed, and sedimentary rocks of the earth; then a comparison is made with data previously published by others as to the relative amounts of the various elements in man and in the seed of *Lolium emulentum*. These elements are arranged in the order of their abundance both from the standpoint of weight and of number of atoms. It is pointed out that in geochemistry and in biology consideration must be given to the quantity of units of matter as well as to the total mass.—*C. H. Farr.*

PROTOPLASM

4700. Allison, R. V. **The density of unicellular organisms.** Ann. Appl. Biol. **11**: 153–168. 1924.—The density of unicellular plant and animal organisms of known diameter was calculated by the formula of Stokes, after measuring their rate of fall through tap water under controlled conditions in a specially constructed cell. The determinations were made on a green alga (*Scenedesmus* sp.) and on protozoan cysts of *Hartimanella hyalina, Colpoda* sp. and *Gonostomum* sp. The value obtained for the average density of the algal cells was 1.098 while that for *Gonostomum* cysts was 1.057. In the former the density values varied greatly between large and small cells, but was fairly constant for intermediate sizes. The protozoan cysts were less variable in this respect. During maturation, cysts of certain *Colpoda* species decreased in volume ½ but increased in average density from 1.04 to 1.06. Many of the 4-day cysts of *Colpoda* excysted during or shortly after their densities were measured, so that the average density of 1.042 for this group is considered a close approximation of the density of the young animals in this early stage. Applying the formula of Hehner and Richmond to these density values, the dry matter of 4-day cysts of *Colpoda* sp. was calculated as 10.6% and that for 20-day cysts as 15.1%. During maturation of the cysts, 64.3% of their total dry matter and 76.2% of their water content was lost. Of the total loss, 90.9% was represented by water and 9.1% by dry matter.—*A. W. Henry.*

4701. Fischer, Hugo. **Von Eigenschaften pflanzlicher Quellstoffe.** [**The properties of plant materials.**] Ber. Deutsch. Bot. Ges. **41**: 11–16. 1923.—The writer attacks the micellar theory of Nägeli and calls attention to the facts that colloidal chemistry has to offer as a basis for his objections.—*Hally Jolivette Sax.*

4702. Weber, Friedl. **Protoplasma—Viscosität copulierender Spirogyren.** [**The viscosity of protoplasm in conjugating Spirogyra.**] Ber. Deutsch. Bot. Ges. **42**: 279–284. 1924.—By means of centrifuging *Spirogyra* filaments the author finds that the protoplasm has an increased viscosity just prior to conjugation.—*Karl Sax.*

DIFFUSION, PERMEABILITY, PHYSICO-CHEMICAL RELATIONS

4703. Brooks, Matilda [Moldenhauer]. **Studies on the permeability of living cells. IV. The penetration of trivalent and pentavalent arsenic into living and dead cells.** Public Health Reports [U. S. A.] **38**: 2951–2966. 1923.—The amount of arsenic penetrating the sap, protoplasm, and wall of a 1-celled marine alga, *Valonia ventricosa*, from solutions of As_2O_5, atoxyl, and As_2O_3 in sea water at H-ion concentrations from pH 5.0 to 9.0 was analyzed chemi-

cally. The highest concentration of arsenic in all cases was found in the protoplasm. The least amount was found at neutrality. Trivalent arsenic does not penetrate so readily into the protoplasm in the acid range but passes more readily through the protoplasm into the sap in all ranges than pentavalent arsenic. Buffers present affect the results. Previous exposure for 1 hour to $NaHCO_3$ increases the accumulation of arsenic in the protoplasm 150% and in the sap 25%; while the amount of trivalent arsenic in the protoplasm is increased by 25% and that in the sap by 100%.—*Author's abstract.*

4704. Davis, C. E., H. M. Salisbury, and M. T. Harvey. **Surface tension of gelatin solutions.** Indust. and Eng. Chem. **16**: 161–163. 1924.

4705. Dixon, H. H., and N. G. Ball. **On the extraction of sap from living leaves by means of compressed air.** [Reprint from Proc. Roy. Dublin Soc. 17^{35}: 1923.] Notes Bot. School Trinity Coll. Dublin **3**: 255–258. 1924.—Branches of *Tilia americana* and *Sambucus nigra* were enclosed in a strong cylinder in such a way that their cut ends protruded. Compressed air at pressures up to 20 atmospheres was admitted into the cylinder. The liquid collected from the cut end of the branch was found to be completely or almost completely free from sugars. Experiments in late and early summer gave similar results. After the leaf cells had been made permeable by means of toluene vapor the sugar in the expressed sap amounted to about 5%.—*G. B. Rigg.*

4706. Dixon, H. H. **Variations in the permeability of leaf-cells.** [Reprint from Proc. Roy. Dublin Soc. 17^{45}: 1924.] Notes Bot. School Trinity Coll. Dublin **3**: 272–279. 1924.—Experimental data are reported leading to the conclusion that protoplasmic permeability is greatly increased by a rise in temperature. *Syringa vulgaris* and *Hedera helix* were used. Leaf temperatures were measured by means of a thermo-couple. Permeability was measured by a modification of Osterhout's electrical resistance method. Objections to the plasmolytic method of measuring permeability in this case are injury to tissues in preparing material for experiment and difficulty in getting good contact between cells and solutions. During sunshine there are temperature differences of 10° or more between shaded and unshaded leaf areas. Differences of permeability resulting from such temperature differences may, when acting in concert with hydrostatic tension throughout the plant, furnish a mechanism for the distribution of dissolved substances throughout the plant body.—*G. B. Rigg.*

4707. Haynes, Dorothy. **A criticism of Beutner's theory of the electromotive force of diphasic liquid systems and their relation to bio-electrical phenomena.** Ann. Bot. **37**: 95–104. 1923.

4708. Kopaczewski, W. **Cellule tissulaire pour mesurer la conductivité électrique. [A cell for measuring the electrical conductivity of tissues.]** Compt. Rend. Soc. Biol. **91**: 401–402. *1 fig.* 1924.—A cell is described with the following advantages: The distance between the electrodes is rigorously determined, the measurement can be made at a constant temperature, the pressure is uniform throughout the tissue.—*Oran Raber.*

4709. Kopaczewski, W. **Tension superficielle en biologie. [Surface tension in biology.]** Compt. Rend. Soc. Biol. **91**: 402–404. 1924.—The surface tension of colloids before reaching a state of equilibrium between the air-liquid phases may present very sharp variations. To avoid these sources of error, measurements must be made under comparable conditions. Practically, with organic liquids such as serums, the equilibrium is reached before the measurement can be made. This is the time of formation.—Besides these variations of very short duration, biological colloids and especially serum undergo a continual diminution of surface tension, due to the gradual flocculation. This lowering of surface tension reaches about 4 dynes in a year for horse serum.—The torsion balance should not be relied upon too much, for the measurements thus obtained differ sensibly from those determined by rigorous physical methods. —*Oran Raber.*

4710. Lapicque, L., and J. Chaussin. **Sur les méthodes de mesure de la concentration moléculaire globale dans les tissus végétaux. [Methods of measuring molecular concentration in plant tissues.]** Compt. Rend. Soc. Biol. **91**: 463–466. 1924.—A method of determining osmotic pressures is described which consists essentially in boiling the plant, making a cryoscopic determination of the resulting liquid, and then making a correction for dilution. The results compare well with the measurements made from juice expressed under the most favor-

able conditions. This method is of wider application and subject to less error, it is thought, than the other methods at present in common use.—*Oran Raber.*

4711. Loiseleur, J. **Sur le mecanisme de l'action thérapeutique des suspensoides. [The mechanism of therapeutic action in the suspensoids.]** Bull. Soc. Chim. Biol. 6: 861–864. 1924.—Collargol acts as a negative catalyzer when added to a solution of colloidal egg-albumin in dilute NaOH. When the albumin is previously coagulated by heat and redissolved in NaOH the catalytic effect of collargol is positive. In the 1st case the rate of hydrolysis is reduced to ½ the check or less, in the 2nd case it is increased at least ⅓. Similar results were obtained with antidiphtheric serum, human and ox serum. The effects of colloidal gold and rhodium were identical. The therapeutic action of suspensoids arises from their effect upon the flocculated elements, as they are without effect upon colloidal elements of the serum.—*Joseph S. Caldwell.*

4712. Mestrezat, W., et M[arthe] Janet. **La dispersion des colloïdes électrolytiques dans ses rapports avec les échanges mineraux cellulaires. [The dispersion of electrolytic colloids in its relations with the mineral exchanges of the cell.]** Bull. Soc. Chim. Biol. 6: 829–853. 1924.—Collodion sacs containing dilute NaCl solution were suspended in solutions containing 4 to 20% of Marseilles soap to which NaCl had been added in concentrations slightly greater than were placed in the sacs. The content of chlorine ions within the sac rises steadily for some days, reaching a concentration considerably in excess of that outside the sac, then declines again until equilibrium is attained. The presence of a trace of potassium alum in the soap solution considerably reduces the difference in concentration attained inside and outside the sac. The viscosity of the soap solution increases to a maximum attained simultaneously with the greatest difference in Cl concentration, then decreases. The conductivity of the soap solution increases so long as the distribution of Cl ions is unequal, then decreases. The changes in the solution within the bag are conditioned by the formation of micellar aggregations in the colloids. Such alterations in the tissue colloids may explain the intake of ions into the cell.—*Joseph S. Caldwell.*

4713. Mestrezat, W., and Marthe Janet. **La dispersion variable des colloïdes protoplasmiques dans ses rapports avec la nutrition minérale de la cellule. [The variable dispersion of the protoplasmic colloids in relation to the mineral nutrition of the cell.]** Compt. Rend. Soc. Biol. 91: 428–430. 1924.—A hypothetical scheme depending upon the chemical affinity of colloids for mineral salts is given to explain certain phases of selective permeability.—*Oran Raber.*

4714. Nageotte, J. **Sur la solubilité des colorants lipo-solubles dans l'albumine et dans les constituants morphologiques de la cellule. [The solubility of lipoid-soluble dyes in albumin and in the morphological constituents of the cell.]** Compt. Rend. Soc. Biol. 91: 639–642. 1924.

4715. Stoklasa, Julius. **Über die Resorption der Ionen durch das Wurzelsystem der Pflanzen aus dem Boden. [The resorption of ions from the soil by the root system of plants.]** Ber. Deutsch. Bot. Ges. 42: 183–191. 1924.—*Zea mais, Triticum vulgare, Secale cereale, Hordeum distichum, Avena sativa, Beta vulgaris, Solanum tuberosum, Medicago sativa, Trifolium pratense* and *Polygonum Fagopyrum* were used to determine certain processes as follows: (1) The acidity of the plant sap as expressed by H-ion concentration in the root system; (2) the amount of CO_2 given off by the root systems of the culture plants; (3) the amount of bacteria which are present in the earth of the root sphere; (4) the respiration intensities of these bacteria; and (5) the H-ion concentration in the soil of the root sphere. The H-ion concentration varied little in the different plants. The acidity is not great and in the cereals and potatoes, the H-ion concentration almost approaches the neutral point. There seems to be no relation between H-ion concentration and the CO_2 given off by the roots. The different plants take up P, Ca, and Mg ions in very different proportions. Some plants, like the Gramineae, show a greater capacity for taking up anions than cations. The reverse was true of the Leguminoseae. This characteristic property to use either the anions or the cations is the fundamental biological factor back of the theory and practice of crop rotation. The cells of the root system are able to absorb qualitatively and quantitatively different ions. The single ions of mineral substances are made available through the CO_2 given off by the root

system and through the CO_2 and various organic acids formed by the bacteria. The problem of unlike work depends on the amount of calories formed in the plant as a whole, since the respiration in the root system increases with the calories. Thus there exists in the whole mechanism of the building up of the new living plant mass, mathematical laws between the assimilation of CO_2 out of the air and the resorption of mineral constituents from the earth.—*Hally Jolivette Sax.*

4716. Strohl, André, and Henry Iodka. **Rôle de la polarisation dans la conductibilité électrique des tissus vivants. [The role of polarisation in the electric conductivity of living tissues.]** Compt. Rend. Soc. Biol. 91: 360–361. 1924.—The authors conclude that the modifications of the conductivity which occur during the passage of a current are due for the most part if not entirely to polarisation, and not as some think to an actual variation in resistance produced by the penetration of the ions of the electrode into the tissue.—*Oran Raber.*

WATER RELATIONS, CONDUCTION

4717. Gertz, Otto. **Laboratorietekniska och microkemiska notiser 5. Om bildningen af kristallsand. Några belysande demonstrations exempel. [The formation of "crystalsand." Methods of demonstration.]** Bot. Notiser 1921: 139–143. 1921.—Calcium oxalate crystals are well known in the cells of many plants, especially in *Rubiaceae, Solanaceae, Chenopodiaceae* and *Amaranthaceae.* Molisch had found them in the bark-cells of *Sambucus nigra;* the author investigated especially the leaves of the last named. The leaves were treated with HCl solution (5 parts HCl and 4 parts H_2O). In variegated leaves, the green cells are larger than the yellowish-white ones and almost filled with crystals. A description is given of the crystals, and of their appearance under different light, and polarization effects. There is a German résumé.—*P. A. Rydberg.*

4718. Iwanoff, Leonid. **Über die Transpiration der Holzgewächse im Winter. II. [The transpiration of trees in winter. II.]** Ber. Deutsch. Bot. Ges. 42: 210–218. 1924.—The author made a study of the winter transpiration of some of the trees with needle-like leaves, and likewise the effect of transpiration on their water balance. The following species were used: *Abies sibirica, Pinus silvestris, P. cembra* and *Picea obovata.* He finds that the needles in the evergreens are better protected from loss of water than are the 1-year-old branches of deciduous trees. The white pine transpires only $\frac{1}{2}$ as much as the larch. The transpiration is 300–400 times weaker in winter than in summer. Two-year-old needles transpire more than 1-year-old needles. With lower temperature there is a lower transpiration. Winter transpiration is injurious to the tree and the distribution of the latter northward is more difficult as its transpiration is increased. The transpiration of the resting branch rather than the relation of the growing branch to the environment determines the northern boundary of the tree.—*Hally Jolivette Sax.*

4719. Lagatu, H., and L. Maume. **Évolution remarquablement reguliére de certains rapports physiologiques (chaux, magnésie, potasse) dans les feuilles de la vigne bien alimentée. [The remarkably regular development of certain physiological relations (calcium, magnesium potassium) in well nourished leaves of grapes.]** Compt. Rend. Acad. Sci. Paris 179: 782–785. 1924.—Analyses were made of leaves on the 18th of each month from May to September inclusive. The percentage of the dry weight of Ca, Mg, and K is calculated. Likewise the alkalinity of each of these elements is determined in terms of the univalence-milligrams required to neutralize one molecule-milligram of HCl. From these data the composite alkaline unit is calculated for each of these 3 elements on each of the 5 dates. This unit is also experimentally determined, and the correspondence between the experimental and the calculated values is found to be very close.—*C. H. Farr.*

4720. Nordhausen, M. **Die Saugkraftleistungen abgeschnittener, transpirierender Sprosse. Eine Entgegnung. [The capacity of the suction force in transpiring shoots. A reply.]** Ber. Deutsch. Bot. Ges. 37: 443–449. 1919.—The author answers Renner's criticisms (Ibid. 1918; Bot. Absts. 2, Entry 549) of Nordhausen's earlier paper (Jahrb. Wiss. Bot. 1917). The measurements under discussion were made by causing transpiring cuttings of *Chamaecyparis, Fagus, Ligustrum, Parottia, Syringa,* and *Chrysanthemum* to satisfy their water needs by

drawing water through porous clay cups, measurements being made by means of a "Potetometer" and an aspirator. The possible effect of differences in structure between conifers and dicotyledons is pointed out.—*G. B. Rigg.*

4721. Ursprung, A., und G. Blum. **Zur Kenntnis der Saugkraft. III. [The suction force.]** Ber. Deutsch. Bot. Ges. 37: 453–462. 1919.—Daily measurements were made on the force of suction in the cells of ivy leaves that were allowed to lie on a table until they died. The methods were those used in their earlier work on fresh leaves. (Ibid. 34: 530–538. 1916.) The largest force recorded (palisade cells) is 15.6 atmospheres. In the drying leaf blades the suction force increased in all tissues except in the palisade distant from the veins. In this last it remained constant, though the osmotic pressure of the cell contents increased; the back pull of the walls is suggested as an explanation. The percentage of increase in the force of suction in the drying blades is greatest in the upper epidermis, the palisade near the veins, and the bordering parenchyma; this is taken to mean that these tissues function as water reservoirs. In fresh leaves the force in the cells of the palisade tissue and the spongy parenchyma is proportional to their distance from the veins. This is construed as explaining the movement of water from the conducting system into these tissues.—In the petiole the epidermis does not seem to function as a water reservoir. The petiole dies after drying 4 days, while the blade lives 7 or 8 days. It seems probable that the blade can make use of the petiole as a source of water.—The conditioning factors in the movement of water from cell to cell and from tissue to tissue are fully discussed, the osmotic pressure of the cell contents and the water pull of the walls being the main factors considered. Attention is also given to the conditions and substances affecting the osmotic pressure of the cell contents. In general, the curve of osmotic pressure for any tissue, like that of the force of suction for the same tissue, follows an upward tendency during drying, but the 2 curves are not parallel throughout.—*G. B. Rigg.*

4722. Ursprung, A., und G. Blum. **Zur Kenntnis der Saugkraft IV. [The suction force.]** Ber. Deutsch. Bot. Ges. 39: 70–79. 1921.—The expression "suction force" is used to replace "concentration of cell sap" and "osmotic pressure" which are considered inexact. The force of suction in the various layers of roots (epidermis, cortex, endodermis, pericycle, parenchyma adjoining the vessels, and vessels) in both the absorbing zone and the older portion was measured and averages of numerous measurements are given in tables. Roots (mostly lateral) of *Vicia faba* and *Phaseolus vulgaris* were used. Radial longitudinal sections were cut and measurements were made with a water-cooled modification of Edringer's measuring apparatus by observing under the microscope just when the cells came into equilibrium with sucrose solutions. Temperature and light, as indicated by controls, did not influence the results. In an earlier paper (Ibid 36: 599, 1918) the authors have reported data demonstrating that there is a force of suction from the root hairs to the vessels and in the present paper they consider the force of suction of the various root tissues in relation to this fact. In general the force of suction was found to increase from the epidermis to the innermost layer of the cortex, but was lower in the endodermis than in the inner cortex. In the light of this fact the existence of a continuous force of suction from the epidermis to the vessels is not thinkable if the force of suction in the endodermis is considered uniform over the whole cell, but does seem possible on the supposition that it is greater on the outside than on the inside and that the values found were an average of these 2 extremes. The conclusion is reached that such differences in the force of suction on the 2 sides of the endodermal cells and possibly also other root cells may account for the known fact of the existence of a fairly continuous force of suction from the epidermis to the vessels. Such differences in the force of suction on the 2 sides of a cell are not demonstrated by the work reported, but it is pointed out that such a condition seems possible since it is known to exist in cells (*Mucor*, for example) that project into the air. The possible relation of Caspary's bands in the endodermal cells to differences in imbibition is discussed, as is also the possibility, in water cultures, of the influence of hydrostatic pressure in the water in the culture vessels. It is emphasized that the force of suction was the only force measured in the work reported in the present paper, and it is recognized that other forces may also operate.—*G. B. Rigg.*

4723. Ursprung, A., und G. Blum. **Zur Kenntnis der Saugkraft. V. Eine Methode zur Bestimmung des Widerstandes, den der Boden der Wasserabsorption durch die Wurzel**

entgegensetzt. [The suction force. V. A method of measuring the force which the back pull of the soil opposes to the absorbing force of the root.] Ber. Deutsch. Bot. Ges. 39: 139–148. 1921.—The investigation is concerned with the measurement of the force which the root hairs or cortical cells must overcome in order to draw from the soil the amount of water necessary for the normal growth of the plant. The experimental evidence reported indicates that the suction force of the root hairs of growing plants, measured by the threshold of plasmolysis with sugar solutions, is a measure of the back pull of the soil.—Root hairs of lateral roots of seedlings (mostly *Vicia faba*) grown in sawdust were found by plasmolysis to have a suction force of 1.1 atm. (atmospheres). When the seedlings were transferred to pure water the suction force of their root hairs decreased gradually and after a few days became zero. When seedlings were transferred from sawdust to 0.02 M sucrose, the suction force of which is 0.05 atm., the suction force of their root hairs decreased gradually to 0.05 atm. On transfer from sawdust to 0.04 M sucrose (suction force 1.1 atm.) the suction force of the root hairs remained 1.1 atm. during the 14 days that they were under observation. On transfer from sawdust to 0.20 M sucrose (suction force 5.3 atm.) the suction force of the root hairs rose gradually to 5.3 atm. The surface cells of the lateral roots died but new roots grew and new leaves were formed. When seedlings were grown in 0.20 M sucrose the suction force of their root hairs was 5.3 atm. and when the number of lateral roots was reduced from 52 to 3 by cutting off a few at a time, the wounds being covered with lanolin, the suction force of the root hairs of the remaining roots rose gradually to 5.9 atm. When a plant was taken from sawdust and so placed that some of its roots were in 0.20 M sucrose and some in water the suction force of the root hairs of the former became 5.3 atm. and that of the root hairs of the latter zero. When plants were grown in moist sawdust which was then allowed to dry out, the suction force of the root hairs rose from 1.1 to 3.2 atm. Increasing the transpiration of a plant by moving it from moist air to a position near a ventilator increased the suction force of the root hairs from 1.1 to 2.1 atm. Lowering the temperature of the sawdust from 18° to 2°C. was accompanied by an increase of suction force in the root hairs from 0.7 to 1.9 atm. Reduction of oxygen by covering the culture with oil resulted in a decrease of suction force in the root hairs from 1.1 to 1.0 atm.—In all cases where the force to be overcome was accurately known it was the same as the suction force of the root hairs of the normally growing plant. From theoretical considerations the author derives the formula: $s = \frac{1}{c} \cdot \frac{W}{n} + \gamma$, where s = suction force of any one root hair, γ = suction force of the solution around the root hair, w = quantity of water absorbed by the root hair in unit time, c = ratio of w to $(s - \gamma)$, n = number of root hairs, W = total quantity of water absorbed by the root in unit time. Of the various factors on which the value of s depends, γ plays the principal rôle, since it represents the lowest level to which s can fall.—The change in the suction force may be correlated with 3 possible factors: (1) Volume changes in the cells due to entrance or loss of water; (2) changes of osmotic pressure following entrance into or exit from the cells, of osmotically active substances, or following chemical changes; and (3) changes in the modulus of elasticity of the cell walls. No information is at hand on the 3rd point, but correlation of the suction force with (1) and (2) seems clear.—The importance of a knowledge of the amount of back pull in the soil for plant propagation and plant geography is emphasized. The work of Briggs and McCall, König, Shull, and Livingston relating to the force with which the soil holds water is discussed and it is pointed out that none of these cover the exact field of this paper.—*G. B. Rigg.*

MINERAL NUTRIENTS, SALT RELATIONS

4724. Boresch, Karl. **Zur Frage der Ersetzbarkeit des Eisens bei der Chlorose. [The question of a substitute for iron in chlorosis.]** Ber. Deutsch. Bot. Ges. 42: 284–290. 1924.—When chromates and manganates are added together to the iron-chlorotic cultures of *Phomidium Retzii* var. *nigro-violacea* there results a rebuilding of the chlorophyll and of its water-soluble accompanying pigments in the same way as this happens following the addition of iron.—*Hally Jolivette Sax.*

4725. Clark, N. C. **The soil organic matter and growth-promoting accessory substances.** Indust. and Eng. Chem. 16: 249–250. 1924.—The question of the action of the organic matter

in the soil in relation to the plant is briefly discussed with particular reference to the "growth-promoting auximones." *Lemna major* was grown in nutrient solution containing monocalcium phosphate, potassium nitrate and magnesium sulphate for a period of 5 months, representing about 30 generations and it was found that these plants maintain their health and reproduce without the aid of organic matter.—*Henry Schmitz.*

4726. Magrou, J., et Albert Berthelot. **Cultures pures de Pellia epiphylla. [Pure cultures of P. epiphylla.]** Compt. Rend. Soc. Biol. 91: 629–630. 1924.—Pellia spores will germinate and produce well developed thalli in a sterile synthetic nutrient medium provided it has the same acidity (pH 4.85) as the ground where this genus of liverworts naturally grows.—*Oran Raber.*

4727. Manceaux, L. H. **Bacilles tuberculeux et sulfate de magnésie. [The tuberculosis bacillus and magnesium sulphate.]** Compt. Rend. Soc. Biol. 91: 255–256. 1924.—*Bacillus tuberculosis* will grow normally in a medium containing as high as 30% $MgSO_4$. It will even grow to a certain extent in a 40% medium.—Cultures which were not doing well on a potato substrate developed much better after the addition of 3% $MgSO_4$.—*Oran Raber.*

4728. Philipson, Carl. **A study on the influence of the ratio between sodium and calcium in a very dilute nutrient solution upon the growth of Svalöf's Dala-oats.** Svensk Bot. Tidskr. 18: 343–370. *9 fig.* 1924.—Distinguishing the influence of the ratio between different ions in the food solution from the nutritive effect of the salts, the author limits the significance of the term antagonism to express the effect of the ratio between the ions, with removal of the terms toxicity and antitoxicity from the definition. Against Osterhout's view it is argued that his antagonism curves, gradually flattening with decreasing concentration, do not exclude the possibility of a simultaneous exercise of antagonistic and nutritive functions of the salts in dilute solutions. In order to investigate whether this possibility is realized or not, the following experiments were carried out. Dala-oats, a pure line from Svalöf, was grown in continuously renewed solution, with acidity and concentration of certain salts (KH_2PO_4, $MgSO_4$, KNO_3 and $FeCl_3$) the same in all cultures. In the 1st experiment, $CaCl_2$ and NaCl were added in 7 different proportions, the sum of the weights of the ions being kept constant; in the 2nd experiment $CaCl_2$ was added in the same concentrations as in the 1st, NaCl being omitted. The reliability of the production curves and the possibility of a comparison of the curve of the 1st with that of the 2nd experiment is discussed. In some of the cultures the physiological disease called grey-spot occurred with a certain regularity according to previous views on its causation. The production-curve of the 1st experiment showed 2 optima, the one at Ca : Na = 100:0, the other at Ca : Na = 10:90, with approximately the same dry-weight. This points to a simultaneous exercise of the nutritive and antagonistic action of the salts. The comparison with the curve of the 2nd experiment, which shows essentially the usual logarithmic form, excludes the possibility that the nutritive action is alone active; it is also probable that nutritive actions must be exercised in dilute solutions. This leads to the conclusion that the difference between the curves of the 1st and 2nd experiment is due to the antagonism between Ca and Na. The possible influence of the antagonism between these ions and the remaining ions of the solution was considered according to previous literature on the subject. No essential objections against the above stated conclusion can be founded on papers known to the author.—Concerning the general idea of the isolated antagonistic effect a tentative suggestion is made. According to the above stated result it may be assumed that the production curve of the 1st experiment represents exactly the effect of 2 factors; the effect of 1 of the factors is shown by the curve of the 2nd. Concerning the hitherto unknown way in which 2 factors work together, 3 independent assumptions are made. According to each of these assumptions the isolated antagonistic effect is calculated and plotted in a curve. The 3 curves are strikingly similar, from which it is concluded that assumptions as to the way in which the 2 factors coöperate may, within wide limits, be arbitrarily chosen without altering the general aspect of the calculated curve. The essential features of this curve are also to be found in Osterhout's antagonism curve for concentrated solutions, which may perhaps point to a certain similarity in the antagonistic effect in concentrated and in dilute solutions. —*Carl Philipson.*

PHOTOSYNTHESIS

4729. Baly, C. C. **Photosynthesis.** Indust. and Eng. Chem. 16: 1016–1018. 1924.—The evidence advanced by Willstätter may be accepted as a definite proof that the 1st product of the photo-assimilation of CO_2 by the living plant is formaldehyde. The experimental realization of this reaction in the laboratory is of great importance, and Moore and Webster were the 1st to show that traces of formaldehyde can be detected in aqueous solutions of carbonic acid after exposure to ultra-violet light. These authors, however, stated that the reaction takes place only in the presence of certain inorganic catalysts. The data presented show that this latter statement is incorrect, since traces of formaldehyde can always be found in pure aqueous solutions of carbonic acid after exposure to ultra-violet light, provided that the exposure is not longer than 12 hours, that the solution is stirred, and that the quartz reaction vessels are placed at least 8 inches from the quartz mercury lamp.—*Henry Schmitz.*

4730. Irvine, J. C., and G. V. Francis. **Examination of photosynthetic sugars by the methylation method.** Indust. and Eng. Chem. 16: 1019–1020. 1924.—A chemical examination of a sirup furnished by Baly and produced by the action of ultra-violet light on formaldehyde solutions showed that in appearance and general properties the material resembled the sirups obtained by condensing formaldehyde or trioxymethylene by means of dilute alkali but also that it had other properties not in common with the latter classes of sirup.—*Henry Schmitz.*

4731. Spoehr, H. A., and J. G. McGee. **Investigations in photosynthesis. An electrometric method of determining carbon dioxide.** Indust. and Eng. Chem. 16: 128–130. 1924.—A method has been devised for determining relatively large quantities of CO_2 in an air stream, with a high degree of accuracy, so that changes in a stream containing over 20 times the amount of CO_2 normally in the atmosphere can be ascertained to 0.002%. The method is based on the absorption of CO_2 in $Ba(OH)_2$ solution and the determination of the change in concentration of the latter through electrical resistance measurements. The necessary precautions and apparatus are described, as well as the mode of constructing a resistance-concentration curve by using, instead of standard HCl, the CO_2 in the atmosphere. The latter thus served as a very dilute solution of CO_2 of known concentration of which carefully measured volumes were used to standardize the $Ba(OH)_2$ solution.—*Henry Schmitz.*

4732. Warburg, Otto, und Erwin Negelein. **Über den Energieumsatz bei der Kohlensäureassimilation.** [**The energy exchanges in carbon dioxide assimilation.**] Naturwissenschaften 10: 647–653. *Fig. 1–3.* 1922.—This is a brief account of a study reported in full in another journal (Zeitschr. Physiol. Chem.). The authors have determined by very careful experiments with *Chlorella vulgaris* the percentage of energy used in carbon dioxide assimilation. They found under certain conditions that 70% of the absorbed radiant energy may be changed over into chemical energy compared with the 6% found by Browne and Escome with higher plants.—*Orton L. Clark.*

METABOLISM (GENERAL)

4733. Anonymous. [**Process for making methyl alcohol for use as a motor fuel from carbon monoxide.**] South African Sugar Jour. 8: 675. 1924.—F. Fischer, Mulheim, Germany, has worked out and patented a process for making methyl alcohol for use as a motor fuel from carbon monoxide by reduction in the presence of a catalyst under pressure, formaldehyde probably being formed immediately. The product is called "Synthol," and a mixture of it with an equal volume of benzol is said to have given satisfactory results in motor trials.—*Nellie E. Fealy.*

4734. Bogsch, Mrs. Aladár, nat. S. Tangl. **Nádcukor kukoricaszárból.** [**Saccharose from corn stalks.**] Természettudományi Közlöny [Budapest] 56: 223–228. 1924.

4735. Bridel, Marc. **Sur l'hydrolyse fermentaire de la monotropitine. Obtention du primevérose.** [**Fermentative hydrolysis of monotropitine. The derivation of primeverose**] Compt. Rend. Acad. Sci. Paris 179: 991–993. 1924.—With fermentative hydrolysis monotropitine yielded primeverose. The latter is now reported in the Betulaceae, Monotropaceae, Primulaceae, Gentianaceae, and Rosaceae.—*C. H. Farr.*

4736. Bridel, Marc. **Sur la présence de trés fortes quantités de maltose libre dans les tubercules frais de l'Umbilicus pendulinus D.C.** [The presence of very large quantities of free maltose in the fresh tubercles of Umbilicus pendulinus.] Compt. Rend. Acad. Sci. Paris 179: 1190–1192. 1924.—Gillot (1923) found free maltose in *Mercurialis perennis*, but did not secure it in pure form. This is accordingly the 1st instance that maltose has been found as a reserve food in plants and has been found to be directly crystallizable. It was tested by rotation, and by the action of invertin and emulsin.—*C. H. Farr.*

4737. Colin, H. **Formation, distribution et circulation de l'inuline dans la tige de Topinambour.** [The formation, distribution, and circulation of inulin in the stem of the Jerusalem artichoke.] Compt. Rend. Acad. Sci. Paris 179: 1186–1188. 1924.—In the leaves autochthonous starch, cane sugar, glucose, and levulose are found, but no levulosanes. Analyses were made of the cortex, pith and xylem of the top, bottom, and middle, respectively, of the stem, as to reducing sugars, sucrose, inulin, and rotary power of reserve carbohydrates. The xylem in all cases has the most inulin, the amount increasing downward in this tissue. The pith also has a considerable amount, but it is higher in this tissue nearer the top of the stem.—*C. H. Farr.*

4738. Corey, A. B., and H. Le B. Gray. **Notes on the preparation of standard cellulose.** Indust. and Eng. Chem. 16: 853–854. 1924.

4739. Corey, A. B., and H. Le B. Gray. **Notes on the preparation of standard cellulose. II.** Indust. and Eng. Chem. 16: 1130. 1924.

4740. Dore, W. H. **Recent progress in the chemistry of pectin and its industrial application.** Indust. and Eng. Chem. 16: 1042–1044. 1924.

4741. Farnell, R. G. W. **The pectin and pentosan content of cane juices, syrups, and molasses and its removal.** Internat. Sugar Jour. 26: 480–486. 1924.—The author describes in detail the work done by him along the lines indicated in the title and the results obtained. Pectin and pentosan content of juices, syrups, and molasses is discussed under 2 headings: (1) pectin determination and (2) pentosan determination. The removal of pectin and pentosan from solution is discussed under 3 headings: (1) the precipitation of calcium pectate from alkaline solution, (2) the precipitation of cane juice pectin by calcium hydroxide $Ca(OH)_2$ and (3) the effect of $Ca(OH)_2$ on the pentosan of cane juice.—*Nellie E. Fealy.*

4742. Franzen, H., and E. Keyssner. **Chemical constituents of green plants. XVII. Occurrence of lactic acid in blackberry leaves (Rubus fructicosus).** Zeitschr. Physiol. Chem. 116: 166–168. 1921.

4743. Freundler, P. **Sur les conditions de stabilisation de l'iode chez les L. flexicaulis.** [The conditions of stabilization of the iodine in Laminaria flexicaulis.] Compt. Rend. Acad. Sci. Paris 179: 1421–1422. 1924.—Three methods of stabilization are described: Increasing the saline concentration; heating at 100°C.; and drying completely at 105°C. It is concluded that diastase is not directly involved in iodine increase.—*C. H. Farr.*

4744. Gorter, K. **L'hiptogene, glucoside nouveau retiré de l'Hiptage madablota Gaertn.** [Hiptagine, a new glucoside from Hiptage madablota Gaertn.] Bull. Jard. Bot. Buitenzorg III, 2: 187–202. 1920.—The properties and derivatives of a new glucoside, hiptagine, are described.—*C. C. Epling.*

4745. Heitz, E. **Eine einfache Methode des gleichzeitegen Nachweises von Assimilation und Atmung.** [A simple method for the simultaneous demonstration of assimilation and respiration.] Ber. Deutsch. Bot. Ges. 41: 41–49. *1 fig.* 1923.

4746. Herissey, H., et J. Cheymol. **Action synthetisante de la d-mannosidase-a, en presence du glycol ordinaire et de la glycerine.** [Synthetic action of d-mannosidase-a in presence of glycol and of glycerin.] Bull. Soc. Chim. Biol. 6: 865–868. 1924.—Previous work has shown (Ibid. 6: 186. 1923) that d-mannosidase-a from lucerne seed forms d-mannosides from several monovalent alcohols. The polyvalent alcohols, ethylene glycol and glycerin, are also acted upon by the enzyme in the presence of mannose to form the corresponding mannosides.—*Joseph S. Caldwell.*

4747. Javillier, M., P. Baude, et S. Levy-Lajeunesse. **Essais d'identification du facteur A. Le facteur A and le phytol.** [An attempt to identify vitamin A. Vitamin A and phytol.] Compt. Rend. Acad. Sci. Paris 179: 998–1000. 1924.—A study is made with a view to

determining the basis for the apparent association of vitamin A with plant pigments. It is concluded that vitamin A is not phytol.—*C. H. Farr.*

4748. Kemp, Emma L. **Some observations on Lonicera japonica Thunb.** Torreya **24:** 103–104. 1924.—Observations were made to determine the time required for the change of color in the flowers of the Japanese honeysuckle. No changes occurred from 7:45 P.M. to 7:45 A.M., few from 7:45 A.M. to 1:45 P.M., and most changes occurred between 1:45 and 7:45 P.M. The rate of change was more rapid when the temperature was higher, the time required varying from 48 hours at an average temperature of 75°F., to 72 hours at 73°F.—*J. C. Nelson.*

4749. Maige, A. **Régénération de l'excitabilité amylogéne des plastes pendant l'hydrolyse. [The regeneration of the amylogenic excitability of plastids during hydrolysis.]** Compt. Rend. Acad. Sci. Paris **179:** 838–840. 1924.—The hypocotyls of fresh bean embryos have cells filled with unilocular amylogenous plastids. If placed in a solution of 5% glucose for 24 hours they give practically no amylose reaction. But if they are left in damp blotting paper for 21 days they will give a strong reaction. The plastids have recovered their excitability during hydrolysis. Comparison is made of the excitability in different cells and in different plastids in the same cell. It is found that amylogenous plastids which have lost their amylogenic excitability during prolonged amylogenesis, may recover it during amylolysis, and this regeneration is more active in cells in which the amylolytic action is more pronounced. Different plastids in the same cell effect the solution of starch at different rates. The plastids of slow dissolution have, in the presence of plastids of rapid dissolution, a more marked amylogenic excitability, corresponding to a more accentuated inhibition of the action of amylase.—*C. H. Farr.*

4750. Maige, A. **Evolution de l'excitabilité des plastes dans les cellules à réserves d'amidon. [The development of excitability in the plastids of cells containing storage starch.]** Compt. Rend. Acad. Sci. Paris **179:** 1426–1428. 1924.—There can exist in cells stored with starch plastids which differ greatly in amylogenic excitability. Those provided with a marked excitability as early as the beginning of the development of the cell produce starch during a prolonged period of synthesis; but their threshold of condensation, increasing with their functioning, becomes higher at the expense of the sugar in the cell, and this phase of synthesis gives place to a phase of hydrolysis. Due to a defective excitability, the other plastids remain in a state of inactivity during the whole period of synthesis by the former, and only exert their amylogenic activity when the latter enter upon a course of dissolution.—*C. H. Farr.*

4751. Pratt, Clara A. **The staling of fungal cultures. I. General and chemical investigation of staling by Fusarium.** Ann. Bot. **38:** 563–595. *1 fig.* 1924.—Fusarium sp. was grown on Richards' solution, and the "staleness" examined by the Botrytis germ-tube method. It was found that exhaustion of food is not of primary importance. Chemical tests indicated that *Fusarium* growing on Richards' solution produced small amounts of alcohol, salts, fatty acids, and, possibly, traces of aldehydes. The amount of NH_3 was very small. Although boiling brought about partial restoration of a stale medium when the culture was still acid, staling was not considered to be due to an enzyme. It was thought rather to be due to the simple organic acids which are toxic at low concentrations. Alcohols and acetaldehyde are toxic only at high concentrations; they can therefore play a very small part, if any, in staling. —*Margaret Newton.*

4752. Randoin, Mme. L., J. Alquier, et Mlles. Asselin et Charles. **Les matières azotées des issues de blé. Etude comparative de leur valeur biologique comme facteurs d'entretien, de croissance et de fécondite. [The nitrogen compounds of the by-products of milling wheat. A comparative study of their biological value as factors in metabolism, growth, and reproduction.]** Compt. Rend. Acad. Sci. Paris **179:** 1342–1345. 1924.—Bran, thirds, shorts, and so forth were analyzed as to nitrogen content, fats, starch, pentosans, cellulose, and ash. The effects of these were studied upon the metabolism, growth, and reproduction of rats and guinea pigs.—*C. H. Farr.*

4753. Ritter, G. J. **Modified method for determining cellulose in wood.** Indust. and Eng. Chem. **16:** 947–948. 1924.—On account of a slightly gelatinous property acquired by cellulose during its isolation by the Cross and Bevan method, the thorough removal of the chemicals used in the process is frequently difficult. Data are given which show the results

obtained by, (1) the modification in the length of the chlorination period, (2) the use of different bleaching agents and their effect on the yields and composition of the cellulose, and (3) the digestion of cellulose on a hot water bath before final washing.—*Henry Schmitz.*

4754. Schmid, F. **Teneur variable des pommes de terre en hydrates de carbone. [The variation of carbohydrate content in potatoes.]** Compt. Rend. Soc. Biol. **91**: 287. 1924.—In dietetics, 20% is considered the average carbohydrate content of potatoes. The amount varies much with age. Old potatoes are found to have 26% and young ones 16%. There may be a variation of as much as 38%.—*Oran Raber.*

4755. Schorger, A. W. **The gelatinization of lignocellulose II.—Action of dilute sodium hydroxide and cuprammonium solutions on the pentosans.** Indust. and Eng. Chem. **16**: 141–144. 1924.

4756. Schorger, A. W. **The constitution of cellulose.** Indust. and Eng. Chem. **16**: 1274–1275. 1924.—The literature dealing with the constitution of the cellulose molecule is briefly reviewed and a structural formula is suggested, which, in the opinion of the author, explains many of the known properties of cellulose.—*Henry Schmitz.*

4757. Schuette, H. A., and A. E. Hoffman. **Notes on the chemical composition of some of the larger aquatic plants of Lake Mendota. I. Cladophora and Myriophyllum.** Trans. Wisconsin Acad. Sci. **20**: 529–531. 1922.

4758. Silveira, Fernando Rodrigues da. **Da chromatogenia vegetal e sua significação biologica. [Plant pigmentation and its biological significance.]** *109 p.* Diagrs. Typ. Revista dos Tribunaes: Rio de Janeiro, 1923.—Plant pigments and their biological significance are discussed according to their functions, structure, and characteristics. A brief summary of conclusions from Bohn to the present day is given and also a bibliography of over 300 entries, p. 95–109. Life is the function of chloro-assimilation. Pigments, as defined, include not only plastid and crystal pigments but the diffused pigments of the protoplasm, cellular sap, nucleus, of the corky and woody tissues (for which pigments the name of xylochromes is proposed), and of the excretions. Chemical properties of pigments are the basis of the classification. The groups are divided—according to functions, chloro-assimilation, protection and nutrition, and excretion. Many structural formulae are given. The physiological classification is rejected. A detailed table of pigments arranged according to chemical properties is given on p. 90–93.—The author is a physician, natural history preparator of the Rio Faculty of Medicine, natural history docent of the Brasilian Federal normal school and Section assistant in the Rio Botanical Garden.—*Marie Kiersted Pidgeon.*

4759. Ultée, A . J. **Zur Identität des Xanthosterins mit dem Lupeol. [Identity of xanthosterins and lupeol.]** Bull. Jard. Bot. Buitenzorg III. **4**: 315–316. 1922.

4760. Ultée, A. J. **Kautschukfreie Milchsäfte. [Caoutchouc-free latex.]** Bull. Jard. Bot. Buitenzorg III. **6**: 264–268. 1924.

4761. Yamaguchi, Y. **Über den Anthocyaninfarbstoff von Ipomoea hederacea. [The anthocyanin of Ipomoea hederacea.]** Ber. Deutsch. Bot. Ges. **42**: 144–147. *2 fig.* 1924.

4762. Ziegenspeck, H. **Über Jod unter Blaufärbung aufnehmende Stoffe in den Asci von Flechten (Isolichenin). [Substances in the asci of lichens staining blue with iodine.]** Ber. Deutsch. Bot. Ges. **42**: 116–119. 1924.—When treated with iodine the young asci in the lichens and various Pezizas and related forms are colored red or blue. They contain isolichenin, which the author was able to isolate, and glycogen. These substances are present in varying amounts in the different forms, some containing practically all lichenin, others all glycogen. These substances gradually disappear as the spores are formed. They are considered as reserve materials.—*Hally Jolivette Sax.*

METABOLISM (NITROGEN RELATIONS)

4763. Bach, Denis. **Sur la toxicité et la valeur alimentaire de l'acetate d'ammoniaque pour les champignons inférieurs. [The toxicity and food value of ammonium acetate for the lower fungi.]** Compt. Rend. Acad. Sci. Paris **179**: 1085–1087. 1924.—The ammonium salts of monobasic fatty acids can be used as a source of N for *Aspergillus repens.* The non-dissociated acids are toxic and their toxicity is associated with the concentration of the ammonium salt and the pH of the media. Alkalinization decreases, and acidification increases. The toxicity

is not due to the hydrogen ions, but to secondary reactions of other constituents.—*C. H. Farr.*

4764. Cerighelli, R. **Sur l'indol des fleurs du Jasmin d'Espagne. [Indol in the flowers of Spanish jasmine.]** Compt. Rend. Acad. Sci. Paris **179**: 1193–1195. 1924.—Indol is found to be a normal constituent of the flowers of this species. In the flower bud it is in the form of a complex compound; upon opening, the flowers set free the indol into the atmosphere. At night it accumulates in the tissues of the flowers, its concentration being about 5–6 mgm. in 100 gm. of tissue.—*C. H. Farr.*

4765. Fulmer, E. I., F. F. Sherwood, and V. E. Nelson. **Effect of ammonium chloride upon the growth of yeast and the hydration of gluten in beer wort.** Indust. and Eng. Chem. **16**: 921. 1924.—The generalization seems to be indicated that if the addition of an ammonium salt to a medium increases its ability to dehydrate gluten, the addition will likewise improve the medium for the growth of yeast, the effect being a maximum in any combination in which the gluten is least swollen.—*Henry Schmitz.*

4766. Harris, Leslie J. **On the existence of an unidentified sulphur grouping in the protein molecule. Part I.—On the denaturation of proteins.** Proc. Roy. Soc. London B **94**: 426–441. 1923.—The evidence is assembled for believing that certain proteins contain a sulphur grouping other than cystine. The group responsible for the nitroprusside reaction in ovalbumen and other proteins seems to result as an essential product of the denaturation of these proteins. The nature of precipitation, denaturation and coagulation are discussed. It is suggested that the nitroprusside reaction, instead of being due to cystine, may be due to the presence of a thiopeptide or similar grouping, which by hydrolysis or keto-enol change could give rise to an active —SH in the resulting metaprotein molecule.—*P. B. Sears.*

4767. Harris, Leslie J. **On the existence of an unidentified sulphur grouping in the protein molecule. Part II.—On the estimation of cystine in certain proteins.** Proc. Roy. Soc. London B **94**: 441–450. 1923.—A new method for gravimetric estimation of cystine in proteins is described. This method yields consistently higher results than have previously been recorded.—*P. B. Sears.*

4768. Strohal, D. **"Squamarin—novi alkaloid." [Squamarin, a new alkaloid.]** Glasnik Hrvatskog Prirodoslovnoga Društva [Zagreb] **32**[1]: 64–65. 1920.—This is a critique of the work of Varićak. The author contests the new alkaloid described and indicates that the methods employed by Varićak were faulty.—*I. Pevalek.*

4769. Thomson, J. Wallace. **A study of the biology of the sprinkling sewage filter.** New Jersey Agric. Exp. Sta. Bull. 352. *1–34. Fig. 1–18.* 1921.—The results of these studies show that there are present in the film of the sewage filter organisms similar to those occurring in the soil which oxidize N from NH_3 to NO_2 and from NO_2 to the NO_3 form. It was found also that there is a rapid decrease in the bacterial content of the sewage as it passes over the stones of the filter, while at the same time there is a proportional increase in the bacterial content of the film of the filter. There are enzymes present in the film breaking up proteins, maltose, dextrose and sucrose. No lactose-splitting enzyme was found.—*Wm. H. Martin.*

4770. Vickery, H. B. **Recent advances in protein chemistry.** Indust. and Eng. Chem. **16**: 1029–1030. 1924.

4771. Wollman, E., et Mme. E. Wollman. **Emploi du Bacterium coli dans la recherche du tryptophane. Application au cas du Bacille tuberculeux. [Use of Bacterium coli in the recognition of tryptophane. Application to the case of B. tuberculosis.]** Bull. Soc. Chim. Biol. **6**: 869–872. 1924.—The fact that *Bacillus coli* rapidly forms indol from tryptophane and that indol in very great dilutions is detectable by Ehrlich's paradimethylamidobenzaldehyde reaction was utilized to determine whether *B. tuberculosis* can synthesize tryptophane when grown upon synthetic media. Tubercle bacilli grown upon media containing asparagin or ammonium succinate as the only source of nitrogen were defatted, subjected to acid hydrolysis or digestion with trypsin, and added to a synthetic solution which was then seeded with *Bacillus coli*. The reaction for indol was positive after 24 hours, being strongest after digestion with trypsin. *B. tuberculosis* is therefore able to synthesize tryptophane from ammonium succinate or asparagin.—*Joseph S. Caldwell.*

METABOLISM (ENZYMES, FERMENTATION)

4772. Berdnikow, A., and D. Andrejew. **Influence de la culture en milieu a écoulement constant sur l'énergie fermentative des levures. [Influence of a constantly changing medium on the fermenting energy of yeasts.]** Compt. Rend. Soc. Biol. 91: 241–242. *1 fig.* 1924.—In the medium in which the nutritive elements are constantly being supplied and the waste products removed, reproduction and fermentation are much more active.—*Oran Raber.*

4773. Dunbar, B. A., and C. F. Wells. **Fermentation of natural fruit juices.** Indust. and Eng. Chem. 16: 739–740. 1924.

4774. Fernbach, A. **Les progrès récents de nos connaissances sur le fermentation alcoolique. [Recent advances in our knowledge of alcoholic fermentations.]** Bull. Soc. Chim. Biol. 6: 873–896. 1924.—This is a review of the more recent literature and a résumé of the work of the author and his collaborators. A bibliography of 53 titles accompanies the paper. —*Joseph S. Caldwell.*

4775. Grey, E. C. **The latent fermenting powers of bacteria.** Proc. Roy. Soc. London B 96: 156–170. 1924.—By the use of Ca formate various bacteria can be made to display fermenting powers otherwise latent. The formate on splitting seems to have more intimate neutralizing powers than chalk or other agents, allowing bacteria to work without the injury commonly arising from the end-products of the bacterial action. An hypothesis of fermentation is offered involving wider powers and fewer enzymes than are usually postulated for bacteria, and it is suggested that carbohydrates and related compounds can be split at any linkage in the carbon chain.—*P. B. Sears.*

4776. Gupta, D. N., and E. R. Watson. **The cause of the low yield in the fermentation of cane molasses.** Internat. Sugar Jour. 26: 591–593. 1924.—The yield of alcohol from the fermentation of molasses is always considerably less than the analyses of the molasses would indicate, and in order to determine the cause of the low yield and if possible a means of increasing it the authors conducted experiments with samples of molasses from the manufacture of Indian guhr. These experiments are discussed in detail under the headings "Fermentation experiments," and "Nature of the reducing substances in spent wash," and show that, in the case of molasses prepared from Indian guhr "the low yield of alcohol on fermentation is almost entirely due to a gum, which, on account of its reducing properties, is returned as reducing sugar in the analysis of molasses. This gum is very resistant to acid hydrolysis and yields no dextrose or levulose on protracted acid hydrolysis. It gives a good yield of mucic acid, and is therefore partly of the galactan type. It may be a mixed gum of the galacto-xylan type." —*Nellie E. Fealy.*

4777. Harada, Ken. **Über die Spaltung der Starke durch Amylase II. [The splitting of starch by amylase II.]** Jour. Biochem. Tokyo 4: 123–137. 1924.—The author has previously described (Ibid. 3: 149–165, 1923. See Bot. Absts. 13, Entry 3875) his method for preparing pure amylose, amylopectin, and maltase-free amylase. This paper reports experimental data. The hydrolysis of amylose by amylase follows the usual course of monomolecular reactions. This is not the case with amylopectin. The variation in velocity of the reaction with the latter is such as to suggest that it contains at least 3 components which are hydrolyzed at unequal rates. Amydulin and starch paste give results which indicate that they are mixtures of amylose and amylopectin. The optimal conditions for action of pure amylase upon pure amylose appear to be 38°C. and a pH concentration of 5. In low concentrations $CaCl_2$, sodium citrate, and Na_2SO_4 accelerate and in high concentrations depress the action of amylase; KCl and NaCl are practically without effect. Aluminium sulphate and sodium phosphate greatly depress action even in low concentrations.—*Joseph S. Caldwell.*

4778. Hérissey, H. **Sur la présence d'un glucoside dédoublable par l'emulsine dans le Baillonia spicata H. Bn. et sur les produits de dédoublement de ce glucoside. [The presence of a glucoside in Baillonia spicata, which can be decomposed by emulsin; and the products of decomposition of this glucoside.]** Compt. Rend. Acad. Sci. Paris 179: 1419–1420. 1924.—Two products are derived from this glucoside, namely, d-glucose and baillonigenol. The latter is a lactonic compound of very characteristic properties which are here described.—*C. H. Farr.*

4779. Lecoq, R. **Dissemblances entre les ferments amylolytiques des différentes préparations d'Orge germée. [Differences between the amylases from different preparations of germinated barley.]** Compt. Rend. Soc. Biol. 91: 924–926. 1924.—Amylase activity depends upon the pH; the presence of mineral salts, in general, and of phosphates in particular; the colloidal condition of the medium; the molecular concentration; and the presence of maltose and dextrins.—In the present investigation amylases were used from malt meal, from malt paste, and extracted from dry malt. The differences found are related to the factors named above.—*Oran Raber.*

4780. Malfitano, G., and M. Catoire. **Le rôle du fer dans la protéolyse de l'Aspergillus niger. [The role of iron in proteolysis by A. niger.]** Compt. Rend. Soc. Biol. 91: 861–863. 1924.—Although a certain amount of iron may be necessary for proteolysis as carried on by *Aspergillus niger* it is determined that the richer it is in iron above this low optimum the more rapidly it loses its power to liquefy gelatin.—*Oran Raber.*

4781. Seckt, H. **Ist Caesalpinia Galliesii Wallich insecktivor? [Is Caesalpinia Gilliesii Wallich insectivorous?]** Ber. Deutsch. Bot. Ges. 42: 138–144. *1 fig.* 1924.—The author finds that the secretion of this plant has only a mild disintegrating effect on the insect and only very small insects are killed. Parts of insects or other albuminous substances remain intact and become desiccated if left in the secretion. The author does not believe that *Caesalpinia Gilliesii* is insectivorous.—*Hally Jolivette Sax.*

4782. Sédallian, P. **Culture du Streptocoque dans le milieu a l'arbutine. [The cultivation of Streptococcus in an arbutin medium.]** Compt. Rend. Soc. Biol. 91: 686–687. 1924.—When grown on a glucoside, arbutin, *Streptococcus* is able to decompose it into glucose and hydroquinone. The pH must be not far from that of neutrality.—*Oran Raber.*

4783. Sideris, Christos P. **The effect of the hydrogen-ion concentration of the extracellular pectinase of Fusarium cromyphthoron.** Phytopathology 14: 481–489. 1924.—This is a discussion of work on the pectinase of *Fusarium cromyphthoron* obtained from liquid media of different H-ion concentrations and growth periods. The enzyme was used as it existed in the original filtrate and in a semi-purified condition for the maceration of onion discs and the hydrolysis of pure pectin. Purification decreased the macerating action of the enzyme. Measured by its action, the amount of pectinase secreted by different cultures varies with the age of the culture and the H-ion concentration of the substratum. Reducing sugars were obtained from the hydrolysis of pectin by pectinase.—*Naomi Chapman.*

4784. Weinberg, M., et B. Ginsbourg. **Rôle du B. putrificus dans étiologie des infections putrides. [Role of B. putrificus in the etiology of putrid infections.]** Compt. Rend. Soc. Biol. 91: 339–341. 1924.—*Bacillus putrificus* is not so strongly proteolytic as *B. sporogenes* or *B. bifermentans*. It digests proteins very slowly. Hence its importance in putrefactions is largely restricted to those of slow development, such as the chronic infections of wounds and of the intestine.—*Oran Raber.*

4785. Weinzirl, John. **Concerning the relation of the bacterial count of the putrefaction of meat.** Amer. Jour. Public Health 14: 946–949. 1924.—Forty samples of spoiled meats were examined aerobically for bacteria and all organisms found more than once were identified. The predominating cultures were *Sarcina lutea* and *Proteus vulgaris*. Others found were *Bacillus mesentericus, B. subtilis, B. vulgatus, Escherichia coli, Pseudomonas fluorescens,* and *Micrococcus liquefaciens*. These organisms and some facultative anaerobes, when inoculated into salmon or beef, did not produce the offensive odors and sulphides characteristic of putrefaction. Inoculations with the anaerobes, *Clostridium putrificum, C. tetani, C. sporogenes* and *C. welchii* from stock cultures did produce the typical condition. Examination of 50 samples of putrefying meat from various sources showed the presence of anaerobes (not named) in all. It is concluded that aerobic and facultative anaerobic bacteria assist in the spoilage of meat but that the putrefactive odor is mainly due to anaerobes. The aerobic bacterial count is only indirectly an indicator of putrefaction but does indicate certain types of spoilage and the sanitary conditions under which the meat is kept. "A test for anaerobes in meat, comparable to the *B. coli* test in water analysis, appears highly desirable."—*C. A. Ludwig.*

4786. Weitz, R., and R. Lecoq. **Analogies entre la ptyaline et l'amylase de l'Orge germée. [Analogies between ptyalin and the amylase of sprouted barley.]** Compt. Rend.

Soc. Biol. 91: 926–927. 1924.—The optimum temperature for ptyalin from the saliva is the same as that for the amylase from sprouted barley,—50° for cooked amylose and 70° for uncooked. The intensity of the reaction varies with the nature of the amylaceous substance used.—*Oran Raber.*

METABOLISM (RESPIRATION)

4787. Aubel, Eugene, and René Wurmser. **Sur l'utilization de l'énergie libérée par les oxydations. [The utilization of energy liberated by oxidation.]** Compt. Rend. Acad. Sci. Paris 179: 848–851. 1924.—The mechanism that permits the transformation of chemical energy into mechanical energy within the organism is not the same as the energy exchange between 2 chemical systems. The fact that the reactions occurring in the synthesis of living matter are reductions leads to the idea that the energy is transmitted by coupled reactions of oxidation-reduction. For instance, when amino acids are synthesized in part from ternary bodies, as pyruvic acid, at the expense of the combustion of a certain quantity of glucose, the oxygen liberated by the synthetic process is consumed directly in the decomposition of sugar, thus, $\cdot 2CH_3 \cdot CO \cdot COOH + 2\,NH_3 \rightarrow 2CH_3CH(NH_2)COOH + O_2$; $1/6\ C_6H_{12}O_6 + O_2 \rightarrow CO_2 + H_2O$. Thus the oxygen in the molecule of free CO_2 is not derived from a mass of free gas, but from a molecule capable of reduction by glucose. This phenomenon is essentially different from that involving oxygen from an external medium. If respiration is reserved for the reactions using free oxygen, then we cannot say that the energy of respiration ever comes from synthetic reactions directly. The lactic acid relations in muscular contraction are discussed, as are also the citric acid relations in fungus metabolism, in the light of this interpretation.—*C. H. Farr.*

4788. Molliard, Marin. **La respiration du Sterigmatocystis nigra dans un milieu de culture faiblement minéralisé. [Respiration of S. nigra in a culture medium of low mineral content.]** Compt. Rend. Soc. Biol. 90: 21–23. 1924.—When the nitrogen and mineral content of a culture medium containing sucrose is much reduced there is a production of gluconic acid by *Sterigmatocystis nigra*. It is natural to suppose that this acid production is a form of incomplete respiration and that the CO_2 production might be accordingly appreciably diminished. This, however, is not the case. If anything, the CO_2 production is increased, showing that the 2 phenomena—CO_2 production and the formation of gluconic acid— are independent. —*Oran Raber.*

4789. Newton, J. D. **Measurements of carbon dioxide evolved from the roots of various crop plants.** Sci. Agric. 4[9]: 268–274. 1924.—Measurements made with various crop plants show a reasonably close correlation between the rates of transpiration and of CO_2 evolution from the roots. It is estimated that much more CO_2 is produced annually in the soil by the decomposition of organic matter than is produced during the growing season by the respiration of the roots of a growing crop. The CO_2 from the latter source may play a much greater part in the economy of the plants than its proportion to the total amount of CO_2 produced in the soil would indicate.—*T. G. Major.*

4790. Sanchez y Sanchez, Manuel. **La vie latente de la plantule. [The latent life of the seedling.]** Compt. Rend. Soc. Biol. 91: 827–828. 1924.—After the seedling has started to develop, further growth is arrested and the plant forced to go into a latent state by hermetically sealing and absorbing the oxygen present. The "latent life" of the plant is conserved much longer by this method than by that of desiccation. Furthermore, there are no sudden changes in the osmotic pressure of the cells as when dried.—*Oran Raber.*

ORGANISM AS A WHOLE

4791. Arloing, Fernand, et Sempé. **Propriétés empêchantes des eaux du Rhône et de la Saône sur le développement de certaines Bactéries. [Properties of the Rhone and Saone Rivers which hinder the development of certain bacteria.]** Compt. Rend. Soc. Biol. 91: 667–669. 1924.—The waters of the Rhone and Saone hinder the development of the coli, Eberth, and dysentery bacilli. The action of the Rhone waters on the typhoid bacillus is especially remarkable.—*Oran Raber.*

4792. Chaussin, J. **Étude de milieu soluble et des tissus insolubles au cours du dé-**

veloppement du blé; influence d'un engrais minéral complet. [A study of the soluble constituents and of the insoluble tissues during the development of wheat; the influence of a complete mineral fertilizer.] Compt. Rend. Acad. Sci. Paris 179: 1195–1197. 1924.—Two contiguous parcels of soil which had not been fertilized for some time were planted to wheat on October 15, 1923. One parcel was then fertilized and also again treated in the spring. The leaves, stems, and heads of the wheat harvested were analyzed on 6 different dates during the growing season as to osmotic pressure of the expressed sap, percentage of dry weight, average molecular weight, and ash content. The leaves remained quite constant in all of these respects. The osmotic pressure of the stem is usually higher than that of the heads, and lower than that of the leaves. The plants on fertilized soil always exhibit higher osmotic pressure than those on the unfertilized.—*C. H. Farr.*

4793. Chaze, J. **Essais de cultures pures d'une Saprolégniée.** [Pure cultures of a Saprolegnia.] Compt. Rend. Acad. Sci. Paris 179: 1188–1190. 1924.—There are given 2 formulae for media, 1 solid and 1 liquid, upon which good growths of *Saprolegnia* were obtained. Zoosporangia can also be induced to develop by using a high concentration of the proper media at 25°C.—*C. H. Farr.*

4794. Dujarric de la Rivière, R., and Etienne Roux. **Floculation des sérums en présence d'extraits alcooliques de microbes ou toxines correspondants.** [Flocculation of serums in the presence of alcoholic extracts of microbes or corresponding toxins.] Compt. Rend. Soc. Biol. 90: 17–19. 1924.—A method is given for preparing alcoholic extracts of bacteria or toxic materials which produce flocculation of blood serum. Extracts have been prepared from meningococci, from typhoid and paratyphoid bacilli, of diphtheria and tetanus toxin, and of an antigen prepared from *Amanita phalloides.*—*Oran Raber.*

4795. Geiger, J. C., Esther Davis, and Harriet Benson. **Experimental relation of the bacteria of the paratyphoid-enteritidis group to poisonings by food.** Amer. Jour. Public Health 14: 578–584. 1924.—"Normal cans of food inoculated with 6 strains of *Bacillus paratyphosus*, A, B, and C, 2 strains each of *B. enteritidis*, and *B. vulgaris* (*proteus*), and incubated at 37°C. for 10 days, showed decided growth increase to occur in many foods. Occasional changes in texture and odor of the food and changes in the appearance of the container take place which would ordinarily cause the food to be discarded. There were no noticeable changes in any of the containers of food inoculated with *B. enteritidis.*"—In dextrose broth with pH of 7.2, at 37°C., the paratyphoid-enteritidis group shows the greatest pH decline after 3 hours, continuing for 24 hours, when a pH of 5.0–4.5 is noted. Such cultures were sterile after 10 days.—The production of poisonous filterable substances by the various strains was extremely variable. They were rarely produced in 6 hours, but cultures sometimes retained their toxicity as long as 10 days. Occasionally the toxic substances resisted boiling at 100°C. for 10 minutes.—*C. A. Ludwig.*

4796. d'Herelle, F. **Sur l'autonomie du Bactériophage.** [The autonomy of bacteriophage.] Compt. Rend. Soc. Biol. 90: 25–27. 1924.—A polyvalent bacteriophage, *h*, is grown upon a Staphylococcus *V* from which a univalent bacteriophage, *v*, had been isolated. The bacteriophage, *h*, adapts itself to the new medium but retains its polyvalent character. Since assimilation and adaptation are the 2 criteria of life, the author concludes that this experiment shows that the bacteriophage is autonomous and living.—*Oran Raber.*

4797. d'Herelle, F. **Sur l'état physique du Bactériophage.** [The physical state of the Bacteriophage.] Compt. Rend. Soc. Biol. 90: 27–29. 1924.—Certain workers have found it possible to distil a liquid, containing bacteriophage, in a vacuum at low temperatures and then to find the bacteriophage in the distillate. They have concluded that bacteriophage is volatile and hence not an autonomous organism. The author shows that these results are obtained because the bubbles of distillate carry with them, when breaking through the surface, some of the bacteriophage. An apparatus is described which permits of distillation and at the same time leaves the surface quiet with no bubbles. Under such circumstances no bacteriophage appears in the distillate. Since the bacteriophage is a corpuscular being it can not be volatile.—*Oran Raber.*

4798. Lappalainen, Hanna. **Biochemische Studien an Aspergillus niger.** [Biochemical studies of Aspergillus niger.] Ofversigt Finska Vetensk.—Soc. Förhandl. 62A[1]: 1–86.

3 pl., 2 fig. 1919–1920. (Also Dissertation, Helsingfors, 1919.)—The 1st part of the paper treats the production by *Aspergillus niger* of fungous starch and its relation to different factors. Fungous starch appears originally in the hyphae in the form of fine grains. They may later appear free, suspended in the nutrient solution, from which they may be separated by filtration or by centrifuging. Often, though not under all circumstances, the starch produced may later disappear completely. Different races of *A. niger* have a variable capacity to produce fungous starch.—The 2nd part of the paper deals with the influence of the culture vessel upon the development of the fungus. In $(NH_4)_2SO_4$-saccharose solution the fungus produces, in vessels of platinum, quartz, or Jena 16-glass (Na-Al-Ba silicate), smooth mats of low dry-weight with abundant conidia. In new or slightly used flasks of Jena N-glass (Na-Al-Zn-silicate) it produces uneven, undulating mycelial mats whose dry weight is much greater, developing, however, very few spores. The latter characteristics are due chiefly to the Zn content of the N-glass. If the N-glass vessels are long in contact with strongly acid nutrient solutions, the amount of Zn given up gradually diminishes, so that the effect on *A. niger* is about like that of quartz vessels. But if the N-glass flasks are subsequently heated with NaOH or Na_2CO_3, a considerable amount of Zn is again given up. Organic acids are produced in larger quantities in cultures with N-glass flasks than in those with 16-glass. In studies on the nutrition of the races of *A. niger*, the influence of the culture vessel should not be neglected. —*R. Collander.*

4799. Moureau, M., et J. Touchais. **Etudes expérimentales sur la vitalité du Bacille tuberculeux dans les livres.** [**Studies on the vitality of tuberculosis bacilli in books.**] Compt. Rend. Soc. Biol. 91: 560–561. 1924.—Contrary to the statements of previous workers, vacation periods are not long enough to render harmless the tuberculosis bacillus in books. Even after 252 days bacilli which had been attentuated by desiccation for 6 hours at 30° were able to infect guinea pigs.—*Oran Raber.*

4800. Santos, Novoa, et F. Gonzalez Criado. **Sur la prétendue anaphylaxie chez les végétaux.** [Anaphylaxy as claimed in plants.] Compt. Rend. Soc. Biol. 91: 820–821. 1924. —After reviewing the literature on anaphylaxy in plants some experiments are reported on *Lilium candidum*, *Clybia minuta*, *Calla aethiopica* and *Mimosa pudica*. An attempt was made to sensitize the plants with bovine serum. The results were negative, no anaphylactic reaction whatever being observed.—*Oran Raber.*

4801. Ulehla, Vladimir. **Über CO_2 und pH-Regulation des Wassers durch einige Süsswasseralgen.** [**Concerning CO_2 and pH regulation of the water by some fresh water algae.**] Ber. Deutsch. Bot. Ges. 41: 20–31. 1923.—The algae studied responded quickly to change in H-ion concentration. Because of this rapidity to response the author believes that the cell membrane, instead of the whole protoplast is involved in the reaction. The author determined the pH value for the different green algae and divided them into 3 classes. (The pH boundaries were narrow.) The CO_2 and H_2S content of the water actually determined the algal associations. He found the pH value of sea water and of running water to be remarkably constant, but that of standing water showed strong fluctuations. Yet such algae as *Cladophora* and *Oedogonium*, with narrow pH limits, actually existed in standing water. They sometimes grew on different rocks, which acted as pH regulators. He found *Oedogonium* with pH 7.5–7.7 growing in a strongly acid water. It was covered with incrustations called *Psichohormiun* which are formed by the bacterium *Sidomonas confervarum* Chol. The latter forms a slimy ring around the algal cells. This bacterium produces the iron carbonate and calcium carbonate, which form incrustations on the algae. The carbonate dissolves with the increase of CO_2, freeing OH ions, thus keeping down the H-ion concentration. This relation the author calls "electrical symbiosis."—*Hally Jolivette Sax.*

4802. Wilson, J. A., and C. J. Vollmar. **Bacteria in tannery soak waters. Similarity in effect of salts upon bacterial counts and upon the stability of colloidal dispersions.** Indust. and Eng. Chem. 16: 367–369. 1924.—Studies of bacteria in tannery soak waters indicate that the bacteria are distributed throughout the water not as individuals, but rather in groups, and that the average number of bacteria in each group tends to vary with the composition of the solution in a manner analogous to the variation in the average sizes of the particles in colloidal dispersions. Bacterial counts as ordinarily made represent only the number of

groups per unit volume of culture medium and not the total number of bacteria planted in the Petri dish. The bacterial count of any soak water was found to be a function of both the kind and concentration of salt present in the culture medium, the count increased to a maximum, in every case, and then decreased gradually to zero.—*Henry Schmitz.*

GROWTH, DEVELOPMENT, REPRODUCTION

4803. Hanna, W. F. **The nature of the growth rate in plants.** Sci. Agric. 5[5]: 133–138. 1925.—This article comprises a review of the literature on the subject of growth rate, with special reference to maize. Particular attention is paid to the various formulae which have been put forward to determine the influence of internal factors. The question of the effects of precipitation, humidity, temperature, and light is also reviewed.—*T. G. Major.*

MOVEMENTS OF GROWTH AND TURGOR CHANGES

4804. Ball, N. A. **Phototropic movements of leaves. The functions of the lamina and the petiole with regard to the perception of the stimulus.** Notes. Bot. School Trinity Coll. [Dublin] 3: 259–264. 1924.—It appears that both lamina and petiole have similar potentialities with regard to the perception of phototropic stimuli. Since, however, the morphological arrangement is such that the petiole will be exposed to differences of light intensity more often than the lamina, movements by which the leaf is turned towards the light will normally be initiated by the petiole, though under certain conditions the bending of the latter may be partially or entirely controlled by the lamina.—Details of experiments on *Oxalis macra* and *Sparmannia africana* are given. The view is taken that phototropic curvatures are due to differences in light intensity on different portions of the surface of the parts involved and not merely to the direction of the light rays. The view is also taken that phototropic response is due to a diffusible substance or hormone.—*G. B. Rigg.*

4805. Dixon, Henry H. **Transmission of stimuli in plants.** Nature 114: 626. 1924.—This is essentially an extended review of Snow's (Proc. Roy. Soc. London B96: 349–374. 1924) discussion of the work of Ricca on *Mimosa pudica*. He regards as unconvincing Snow's reasons for assuming that the mechanism for the transmission of stimuli in leaves is fundamentally different from that in stems.—*O. A. Stevens.*

4806. Gassner, G. **Über die Untersuchungen von J. Zeidler zur Frage des Galvanotropismus der Wurzeln.** [Concerning the researches of J. Zeidler on the question of the galvanotropism of roots.] Ber. Deutsch. Bot. Ges. 41: 17–19. 1923.—When strongly stimulated, the roots of peas were positively galvanotropic. When weakly stimulated they reacted negatively. The perception of the negative galvanotropism is definitely located at the tip, while positive curvatures were also obtained by stimulation of higher zones. Cytological and anatomical studies showed that the positive curvature was a pure traumoatropic curvature. The side of the root toward the positive pole was injured or killed. The negative curvature is also caused by injury on the positive side.—*Hally Jolivette Sax.*

4807. Heilbronn, A. **Beiträge zum Epinastie-Problem. I.** [Epinasty. I.] Ber. Deutsch. Bot. Ges. 41: (33)–(41). 1923.—Two hundred and seventeen leaves of *Tropaeolum majus* were measured. The upper $\frac{2}{3}$ of the petiole formed an angle of 69 ± 9.30 with the horizontal. The angle varied with the time of day and with the temperature. The tip bent downwards. Anatomical study showed dorsiventrality of the petiole in the arrangement of the vascular bundles and in depth of the chlorophyll-bearing tissue. Disturbance of the position of equilibrium of the petiole is the cause of the dorsal convex curvature. The normal orientation of the petiole of *T. majus* is the result of the combined effect of phototropism, geotropism, and epinasty. Epinasty tends to bring the stem to a position where it is geotropically stimulated. Then the geotropic stimulus places it away from its epinastic tendencies. The effect of first one stimulus, then the other, causes the phenomena of nutation.—*Hally Jolivette Sax.*

4808. Jost, L. **Über den Geotropismus des Grasknoten.** [Geotropism of grass nodes.] Ber. Deutsch. Bot. Ges. 42: 338–344. 1924.—Wheat, rye, oats, and corn were used in the study of the geotropism of grass nodes. When cut longitudinally and laid horizontally both cut surfaces increase equally whether they face upward or downward. The increase is the same as in the intact nodes. The chief difference between the grass nodes and an entire stem

is that in one case both longitudinal halves curve, in the other only the under side curves.—*Hally Jolivette Sax.*

4809. Stark, Peter. **Geotropische Reizleitung bei Unterbrechung des organischen Zusammenhangs.** [Geotropic stimulations on breaking the organic continuity.] Ber. Deutsch. Bot. Ges. 42: 125–130. 1924.—Several series of experiments were made using roots of *Avena sativa* and *Hordeum distichum*. The geotropic reaction time and the angle of curvature were noted with the roots intact, with the roots decapitated and the tip replaced, and with the roots decapitated without replacement of the tips. The decapitated root with the tip replaced gave results midway between the normal root and the decapitated root without replacement. Experiments with *Triticum polonicum*, wherein the decapitated root was replaced on strange roots, gave the same results as when replaced on its own root. The traumatropic effect is considered. The chemical processes play an important role in geotropic reactions as in the other tropisms.—*Hally Jolivette Sax.*

GERMINATION, RENEWAL OF ACTIVITY

4810. Perkins, A. J. **Some causes of defective germination in wheat.** Jour. Dept. Agric. South Australia 25: 768–777. 1922.

4811. Rafaïlesco, M. **Action de l'eau iodée sur la germination.** [Effect of iodated water on germination.] Compt. Rend. Soc. Biol. 90: 24–25. 1924.—Water which contains not more than 0.7 mgm. of iodine per cc. of water favors the germination of *Lepidium sativum*, wheat, oats, and barley but only during the 1st week. For higher doses the germination is retarded or stopped according to the length of exposure.—*Oran Raber.*

RADIANT ENERGY RELATIONS

4812. Friedli, Hans. **Absorption des rayons ultra-violets par les dérivès de l'émoglobine. Contribution à l'étude de la constitution chimique des matieres colorantes du sang.** [Absorption of ultraviolet rays by hemoglobin derivatives, a study of the chemical constitution of the coloring matter of blood.] Bull. Soc. Chim. Biol. 6: 908–934. 1924.—The spectra of pyrrol, indol, alpha and beta methyl-indol, hemin chloride, alpha and beta hemin bromide, hematin, hematoporphyrine dimethyl ether, mesoporphyrine hydrochloride, and the imide and anhydride of hematinic acid are described.—*Joseph S. Caldwell.*

4813. Stoklasa, Jules, et Jos. Penkava. **La radioactivité des gaz éruptifs du Vésuve et des solfatures de la Campanie et leur influence sur le développement des bactéries et des plantes supérieures.** [The radioactivity of the gases from the eruptions of Vesuvius and from the Solfatara of Campania and their influence on the development of bacteria and the higher plants.] Compt. Rend. Acad. Sci. Paris 179: 819–822. 1924.—The radioactivity of the atmosphere as well as of the soil favors the development of legumes, especially *Spartium junceum* and *Robinia pseudoacacia*. The nitrogen-fixing bacteria are also noticeably favored by radium emanations due to α rays. The β and γ influence the leaves. As throwing light on the chemistry of photosynthesis, it is found that light and radioactivity will cause potassium bicarbonate to produce formic acid, oxygen, and potassium carbonate, and that, further, formic acid is changed into formaldehyde and oxygen.—*C. H. Farr.*

TOXIC ACTION

4814. Brenchley, Winifred E. **The effect of iodine on soils and plants.** Ann. Appl. Biol. 11: 86–111. 1924.—The influence of iodine in the soil on plant growth, on the soil flora, and on the germination and damping-off of seedlings was tested. No evidence of partial soil sterilization was obtained. No decrease in the amount of damping-off of tomato seedlings was obtained when a wide range of concentrations of iodine in sodium iodide were added to the soil. The germination of tomato seed was not affected, while germination of barley and mustard seed was inhibited or badly checked. The various means whereby iodine may become inactive in the soil are discussed.—*J. G. Leach.*

4815. Conover, John R., and John L. Laird. **Direct unit phenol coefficient: A new method.** Amer. Jour. Public Health 14: 1043–1047. 1924.—Present methods of determining

the germicidal value of disinfectants are not completely satisfactory, chiefly for the following reasons: (1) They depend too much on the personal equation and too little on standardized units, for example, the time period and the strength of the phenol control are variable and are different for each set of tests; (2) *Bacillus typhosus* is used as the test organism, while tests have shown this organism to have a variable physiology and to be more susceptible to germicides than many other organisms against which it is necessary to obtain protection; (3) although rather complicated, they permit the testing of germicides incorporated in water or soap emulsions only, and cannot be used with preparations such as ointments. To overcome these objections the "direct unit phenol coefficient" was established in the Pennsylvania Department of Health and has been used for several years. This method uses for the check germicide a 1 to 75 aqueous solution of phenol and for the organisms "a strain of *Staphylococcus aureus* and one of diphtheroids from any source," transplanted every 24 hours on a meat infusion—bactopeptone—1½% agar medium, at pH = 7.6, with an incubation temperature of 37°C. This strength of phenol will destroy all of the test organisms in less than 5 minutes. Specific instructions are given for carrying out the tests.—*C. A. Ludwig.*

4816. Lipska, Irène. **L'action des cations appliquée comme moyen de constater le degré de parenté entre les six espèces de Citromyces. [The action of cations as a means of determining the relationships between the six species of Citromyces.]** Acta Soc. Bot. Poloniae 2: 161–182. 1924.—This work has to do with the effects of the sulphates of Cd, Cu, Ni, Zn, Fe^{+++}, Co, Fe^{++}, Mn, Na, K, NH_4, and Mg when added to Lindner's nutrient medium. A plea is made for placing such solutions on a gram molecular basis instead of the usual percentage basis. Cd, Cu, and Fe^{+++} are shown to be the most toxic of the series studied. With the resistance to the cations as a criterion, the author has attempted to show the relationships of the 6 species of *Citromyces*, and finds the cations most useful for this purpose to be Mn, Fe^{++}, Fe^{+++}, in 6 dilutions ranging from 1.0 to 0.00001 mol. The species fall into the *C. Pfefferianus* and the *C. glaber* groups when tested by this method. The species are further keyed out by their reactions to Zn, NH_4, Ni, and Al cations into *C. Pfefferianus*, *C.* sp., and *C.* sp. of the 1st group, and *C.* sp., *C. glaber*, and an Amsterdam strain of *C. glaber* in the 2nd. Resistance was measured by the time required for the mycelium to cover a given area, the amount of sporulation, and time required for germination, instead of the usual method of weighing the dried mycelium.—*D. H. Linder.*

4817. Priestly, J. H. **Toxic effect of illuminating gas upon plants.** Gas Jour. 158: 443. 1922.

4818. Sakamura, T. **Über die Selbstvergiftung der Spirogyren im destillierten Wasser. Auto-intoxication of Spirogyra in distilled water.]** Bot. Mag. Tokyo 36: 133–153 (also, Ibid 36: (151)–(197), in Japanese). 1922.—*Spirogyra* spp. which are rich in starch secrete acids when placed in distilled water. This acid production is sufficient to cause toxic effects, which the author considers auto-intoxication. These results indicate the necessity of avoiding the use of *Spirogyra* spp. rich in starch as experimental material in certain physiological work. This auto-intoxication may be prevented by the use of $CaCO_3$ in the distilled water.—*Harry Braun.*

4819. Schmidt, E. W. **Über zellphysiologische Versuche mit Digitonin. [Cell physiological experiments with digitonin.]** Ber. Deutsch. Bot. Ges. 42: 136–138. 1924.—The effect of a 1% solution of digitonin on Mougeotia filaments is to bring about the division of the filament. The chromatophore of the cell becomes paler. The author suggests the term "chlorolyse" to signify this fading of the color in the chloroplasts.—*Hally Jolivette Sax.*

4820. Sierakowski, S., and F. Milejkowska. **Sur l'action bactéricide des concentrations en ions hydrogène pour les différentes espèces microbiennes. [The bactericidal action of various concentrations of hydrogen ions for different species of bacteria.]** Compt. Rend. Soc. Biol. 91: 714–715. 1924.—After a description of the method used, a table is given with the maximum and minimum pH which 26 different species of bacteria were able to endure.—*Oran Raber.*

4821. Woffenden, Lettice M., and J. H. Priestly. **The toxic action of coal gas upon plants. II. The effect of coal gas upon cork and lenticel formation.** Ann. Appl. Biol. 11: 42–53. 1924.—The development of cork phellogen in the stem of *Sambucus* is briefly traced,

and the effect of coal gas upon the stem at different developmental stages is described. The results support the view that the unsaturated gaseous hydrocarbons of the coal gas so increase the mobility of the unsaturated fatty acids that they fail to remain in and on the walls, so that no suberin lamella is formed. The proliferation of tissue formed from the cork phellogen is compared with the aerenchyma formed upon plant surfaces immersed in stagnant water.—*J. G. Leach.*

MISCELLANEOUS

4822. Anonymous. **Ithaca meeting of the sugar section of the American Chemical Society.** Internat. Sugar Jour. 26: 597–599. 1924.—Summaries are given of some of the papers read at the Sixty-eighth Meeting of the American Chemical Society at Ithaca, New York, September 8–13, 1924, as follows: (1) Constitution of synthetic dextrins, J. C. Irvine; (2) a study of certain abnormal rises in purity of cane juice during clarification, C. E. Coats and F. J. Robichaux; (3) inversion losses during refining with vegetable carbons, C. F. Walton, Jr., M. A. McCalip, and W. F. Hornberger; (4) investigations of colloids in cane and beet sugar manufacture, H. S. Paine and M. S. Badollet; (5) the moisture absorption and caking of granulated sugar, M. J. Proffitt, V. C. Swicker, and J. Greenwald; (6) preliminary results on the utilization of Steffen waste water, W. J. Geldard; (7) industrial applications of invertase, H. S. Paine, C. F. Walton, Jr., and M. S. Badollet; and (8) method for the manufacture of levulose, R. F. Jackson, C. G. Silsbee, and M. J. Profitt.—*Nellie E. Fealy.*

4823. Anonymous. **Mr. Farnell's sugar research work.** Internat. Sugar Jour. 26: 461–463. 1924.—Immediately after his appointment in 1921–1922 as chemist to the British Empire Sugar Research Association Farnell directed his attention to the colloids of cane juice. A brief résumé of his work and results is as follows: "He has shown the following colloidal substances to be present in mill juice: Protein (principally albumin); pentosan and pectin (both derived from cane fibre), tannin, wax, and silica. He has examined methods of estimating the amount of pectic substances (pectinogen and peptic acid) in cane fibre. He has studied the role of pectin and pentosan in clarification, and has demonstrated that while the former constituent is removed in alkaline clarification, the latter is not eliminated, and continues to persist throughout the manufacture till it accumulates in the final molasses, although in the carbonation process it is precipitated, probably as a result of its absorption on the granular calcium carbonate at the time of its formation. He has followed the behaviour of albumin in the liming and heating processes of clarification, and has confirmed the observation that if the lime be added to the heated juice this protein is more completely eliminated than in the usual procedure of liming in the cold and afterwards heating. He has investigated the effect of superheating unlimed juice in relation to Muller's theory of the presence of colloidal silicious compounds and their decomposition at a high temperature, and has proved that part of the silica present is in this way precipitated. Then he has determined the actual amount of colloids (separating them from the crystalloids by dialysis), and it is surprising to notice how small an amount of these substances he found to be present, the importance of their presence thus being made evident."—It is believed that Farnell's researches may have direct application in cane-sugar manufacture.—*Nellie E. Fealy.*

4824. Rouillard, L. E. **Carbonation versus sulphitation in the manufacture of white sugar in Natal.** Internat. Sugar Jour. 26: 600–602. 1924.—In experiments made to ascertain the limit up to which sulphitation could be carried to obtain a high-grade sugar the juice was sulphured with from 1 to 4 gm. of sulphurous acid per l., an equivalent proportion of lime being added to reduce the acidity, and because of the difficulty experienced with such a heavy sulphitation, recourse was had to a double sulphitation process by which the juice was limed and sulphured and subsequently pumped through a 2nd sulphitation column, being ultimately partly neutralized with lime. "Subsidation under the treatment left nothing to be desired, and filtration was comparatively good," but the sugar produced, although of good quality, could not be called 1st-rate white sugar. When in addition to this process the syrup was sulphured, a better quality of sugar was produced, but still it could not compare with samples of the best obtained with sulphitation in conjunction with phosphoric acid. In spite of these results the author believes it would be rash to declare that the best mill-white sugar cannot be

secured by sulphitation alone. The carbonation process and use of phosphoric acid are discussed, and the author gives the following conclusions: (1) Simple neutralization of juice by lime (the defecation process) has comparatively no effect on the gums and leads to the formation of extremely viscous final products which cannot be properly cured; (2) moderate sulphitation produces a better juice, but the gums are not sufficiently removed to secure the highest possible recovery; (3) the most liberal sulphitation does not seem to clarify the juice to the extent necessary for the production of the best white sugar; (4) phosphoric acid appears to materially help the removal of certain coloring matter in the juice; and (5) the great advantage of the carbonation process over sulphitation lies in the complete removal of all objectionable impurities by filtration at the initial stage, leaving extremely fluid after-products which do not require further treatment. Interesting data regarding liming of cane juice in different countries are given.—*Nellie E. Fealy.*

4825. Sando, C. E. **Continuous extraction apparatus for large quantities of plant materials.** Indust. and Eng. Chem. 16: 1125. 1924.—Details and diagrams are given for the construction of a convenient and inexpensive extraction apparatus suitable for the extraction of large quantities of plant material.—*Henry Schmitz.*

4826. Vilmorin, Jacques de. **The role of chemistry in the selection and improvement of plants.** Chimie et Industrie 7: 864–869. 1922.

TAXONOMY OF VASCULAR PLANTS

J. M. Greenman, *Editor*

E. B. Payson, *Assistant Editor*

(See also in this issue Entries 4026, 4104, 4107, 4110, 4113, 4118, 4128, 4131, 4140, 4167, 4181, 4184, 4196, 4200, 4203, 4214, 4215, 4218, 4221, 4224, 4225, 4232, 4253, 4304, 4417)

GENERAL

4827. Fernald, M. L. **Hoffmann's Flora of Berkshire County, Massachusetts.** [Rev. of: Hoffmann, Ralph. **Flora of Berkshire County, Massachusetts.** Proc. Boston Soc. Nat. Hist. 36: 171–382. 1922 (see Bot. Absts. 13, Entry 6967).] Rhodora 24: 183–187. 1922.—This is a critical review with much original matter.—*M. L. Fernald.*

4828. Fernald, M. L. **A misleading addition to the state floras of New England.** [Rev. of: Providence Franklin Society. The ferns, fern allies and flowering plants of Rhode Island. 1920.] Rhodora 24: 96–100. 1922.—This is a critical review with much original matter and an enumeration of about 60 species whch are included in the published list through obvious errors of identification.—*M. L. Fernald.*

4829 Kessell, S. L., and C. A. Gardner. **A new form of botanical key.** Australian Forest. Jour. 7: 297–301. 1924.—The decimal system is suggested as a new departure in the making of botanical keys. The authors claim that such a key can be used with ease by persons without a knowledge of botany and illustrate their scheme by applying it to the eucalypts of Western Australia.—*C. F. Korstian.*

4830. Kops, Jan, F. W. van Eeden, en L. Vuyck. **Flora Batava. Afbeelding en Beschrijving der Nederlandsche Gewassen. [Flora of Batavia. Illustrations and descriptions of plants of Holland.]** 418e–421e Aflevering. *Pl. 2065–2080.* Martinus Nijhoff: 's-Gravenhage, 1924.—The vascular plants described and illustrated in the present parts are: *Rubus foliosus* Wh. & N., *R. carpinifolius* Whe., *R. fuscus* Wh. & N., *Verbascum Blattaria* L. floribus albis, *Rumex obovatus* Danser, and *Reseda phyteuma* L. The nonvascular plants included are *Tricholoma ramentacea* (Bull.) *Ricken, Hebeloma sacchariolens* Quél., *Coprinus niveus* (P.) Fr., *Pleurotus corticatus* Fr. var. *tephrotrichus* Fr., *P. applicatus* Batsch, *P. serotinus* Schrad., *P. cornucopioides* P. var. *sapidus* Kalchbr., *Morchella elata* Fr., *Merasmius perforans* Fr., *Odontia aurea* (Fr.) Quél., *Cyphella sulfurea* (Batsch) Fr., *Clavaria Kunzei* Fr., and *Pholiota erebia* Fr.—*J. M. Greenman.*

4831. Schürhoff, P. N. **Die Haploidgeneration der Blütenpflanzen (siphonogamen Embryophyten). [The haploid generation in flowering plants (siphonogamous embryophytes).]**

Bot. Jahrb. 59: 198–293. 1924.—Our knowledge of the flowering plants, both in general and as to taxonomy, has heretofore been based almost entirely on the diploid generation. In this paper an attempt is made to describe the haploid generation in the various taxonomic groups of Angiosperms and Gymnosperms. The work is a very comprehensive compendium of our present knowledge of this generation in all the various groups. Appended is a long bibliography, and an index to the genera and families.—*K. M. Wiegand.*

PTERIDOPHYTES

4832. Fernald, M. L. **Lycopodium sabinaefolium and L. sitchense.** Rhodora 25: 166, 167. 1923.—The 2 plants cannot be maintained as species, but seem to be ecological varieties; *L. sabinaefolium* Willd., with dorsivental branchlets and loose habit, is characteristic of woods and thickets; *L. sitchense* Rupr., with more terete branchlets and compact habit, occurs chiefly in the open. Search for additional characters has proved fruitless and *L. sitchense* is therefore reduced to *L. sabinaefolium* Willd. var. *sitchense* (Rupr.) n. comb.—*M. L. Fernald.*

4833. Fernald, M. L. **The southern variety of Thelypteris fragans.** Rhodora 25: 1–4. 1923.—The author considers *T. fragrans* (L.) Nieuwl. to consist of 2 geographic varieties: the typical arctic form of the plant with stiff coriaceous fronds about 1 dm. long, the stipe and rachis densely chaffy; and var. *Hookeriana* n. var. with more membranaceous, much longer and less chaffy fronds, occurring from Newfoundland to New England and Minnesota, also in temperate eastern Asia.—*M. L. Fernald.*

4834. Maxon, William R. **Report upon a collection of ferns from Tahiti.** Univ. California Publ. Bot. 12: 17–44. *Pl. 1–6.* 1924.—Sixty-six species are listed, 3 of which are new and several others interesting because of their extreme rarity or of their peculiar morphology. The new species are: *Stenochlaena Setchellii*, *Dryopteris sciaphila*, and *Tectaria tahitensis.*—*W. A. Setchell.*

4835. Parlin, John C. **Selaginella apoda in Maine.** Rhodora 25: 188. 1923.—In 1861, Goodale recorded *S. apoda* (L.) Fernald (as *S. apus* Spreng.) from Wells, Maine, but the vouchers were lost in the great Portland fire and the species has subsequently been unknown in Maine. It is now rediscovered in an adjoining town.—*M. L. Fernald.*

SPERMATOPHYTES

4836. Ashe, W. W. **Notes on trees and shrubs of the southeastern United States.** Rhodora 25: 179–183. 1923.—The following plants are described as new or redefined: *Quercus caput-rivuli* n. sp. possibly a hybrid of *Q. megacarpa* Ashe and *Q. arkansana* Sarg., from Florida; *Carya ovalis mollis* n. var. with leaflets soft-pubescent beneath, from Ohio: *Robinia grandiflora* Ashe redefined and *R. speciosa* n. sp., both from North Carolina, set off from it; *R. fertilis* n. sp. related to *R. hispida* L.; the types of *R. Boyntonii* Ashe and *R. longiloba* Ashe defined. *M. L. Fernald.*

4837. Beccari, O. **Neue Palmen Mikronesiens.** [New palms from Micronesia.] Bot. Jahrb. 59: 11–16. 1924.—Two genera, **Gulubiopsis** and **Ponapea**, are described as new and also the following species: *Gulubiopsis palauensis*, *Ponapea Ledermanniana*, and a description is given of *Bentinckiopsis carolinensis* Becc. previously published.—*K. M. Wiegand.*

4838. Bertoni, Moisés S. **Contribuciones preliminares al estudio sistematico, biologico y economico de las plantes del Paraguay.** [Preliminary contributions to a systematic, biological and economic study of the plants of Paraguay.] Anal. Cien. Paraguayos II, No. 2, *P. 135–142.* 1918.—The following new species and subordinate categories are described: *Cedrela tubiflora*, f. *typica*, vars. *grandifolia* and *intermedia*, subsp. *bertoniensis*, f. *typica*, f. *augustifolia*, and var. *lagenaria; Chorisia Josephinae; Phaseolus Bertonii* Frances, and f. *albus* Frances.—*J. M. Greenman.*

4839. Black, J. M. **Additions to the flora of South Australia No. 21.** Trans. and Proc. Roy. Soc. South Australia 47: 367–370. *Fig. A–E.* 1923.—The following species and varieties are described as new: *Centrolepis Murrayi; Kochia excavata; K. excavata* var. *trichoptera; K. tomentosa* (Moq.) F.v.M. var. *enchylaenoides; Bassia paradoxa* (R. Br.) F. v. M. var. *latifolia; Ptilotus Murrayi* F. v. M. var. *major; Amaranthus Mitchellii* Benth. var. *grandiflora;*

Trianthema crystallina Vahl var. *clavata; Calandrinia remota; Hutchinsia eremaea; Acacia calamifolia* Sweet var. *euthycarpa; A. sclerophylla* Lindl. var *lissophylla; A. aneura* F. v. M. var. *latifolia; Indigofera longibractea; Cassia Sturtii* R. Br. var. *involucrata; Pultenaea trinervis;* and *P. villifera* Sieb. var. *glabrescens.*—*Wm. Randolph Taylor.*

4840. Blake, S. F. **Notes on the North American species of Limonium.** Rhodora 25: 55–60. 1923.—*Limonium angustatum* (Gray) Small is reduced to varietal rank under *L. carolinianum* (Walt.) Britton and its range extended north to southern New York. *L. Nashii* Small, heretofore regarded as a strictly southern species, is extended north to Long Island, and *L. trichogonum* Blake is reduced to varietal rank under it. The range of *L. californicum* (Boiss.) Heller is extended south quite to San Diego and inland to Nevada. A new key is published and the following North American species and varieties are now recognized: *L. carolinianum* (Walt.) Britton; *L. carolinianum* var. *angustatum* (Gray) n. comb.; *L. mexicanum* Blake; *L. Nashii* Small; *L. Nashii* var. *trichogonum* (Blake) n. comb.; *L. californicum* (Boiss.) Heller; *L. limbatum* Small.—*M. L. Fernald.*

4841. Blake, S. F. **Oenothera perennis L., var. rectipilis (Blake) comb. nov.** Rhodora 25: 47. 1923.—This combination is based on *O. pumila* var. *rectipilis* Blake. The variety has a definite range in southeastern Canada.—*M. L. Fernald.*

4842. Blake, S. F. **The forms of Osmorhiza longistylis.** Rhodora 25: 110, 111. 1923. —Three varieties are distinguished: *O. longistylis* (Torr.) DC. (typical), with glabrous stems; var. *brachycoma* n. var., with puberulent stems, etc.; var. *villicaulis* Fernald, with villous stems, etc.—*M. L. Fernald.*

4843. Blaringhem, L. **Sur un caractère particulier des fruits du genre Linum. [A particular character of the fruits of Linum.]** Bull. Soc. Bot. France 69: 776–781. 1922.—Use is made of the presence of bent partitions in the fruits as a character for separating species. Brief descriptions of 7 previously published species are given.—*P. A. Young.*

4844. Brackett, A. **Some genera closely related to Hypoxis.** Rhodora 25: 155–163. *4 fig.* 1923.—Consideration is given of the relationships of *Hypoxis* with illustrations of *Curculigo scorzoneraefolia* (Lam.) Baker, *Pauridia minuta* (L. f.) Durand & Schinz, and *Molineria recurvata* (Ait. f.) Herbert, showing that their seed are essentially those of *Hypoxis.* The *Hypoxideae* have very characteristic seed which are very different from those of other Amaryllidaceae, though the genus *Pauridia,* with seed resembling miniature seed of *Hypoxis hirsuta* var. *leptocarpa* (Engelm. & Gray) Brackett, is placed by Pax in the Haemadoraceae, simply because it has 3 instead of 6 stamens.—*M. L. Fernald.*

4845. Brandegee, Townshend. **Plantae Mexicanae Purpusianae.** Univ. California Publ. Bot. 10: 403–421. 1924.—The following new species or varieties are proposed: *Callisia parvula, Echeandia Purpusii, Pouzolzia Purpusii, Aristolochia oblongifolia, Coccoloba petrophila, Pisonia Purpusii, Lonchocarpus fuscopurpureus, Machaerium chiapense, Tephrosia albida, Crotalaria monticola, C. chiapensis, C. quercetorum, Desmodium monticola, Æschynomene chiapensis, A. arenicola, A. pinetorum, Petalostemon chiapense, Stylosanthes eciliata* Blake n. sp., *Mascagnia polycarpa, Banisteria nemorum, Bunchosia monticola, Picrasma mexicana, Acalypha chiapensis, A. unibracteata* Müll. Arg. var. *heterantha, Pedilanthus petraeus, Cormonema multiflorum, Triumfetta dioica, Turnera violacea, Tauschia pinetorum, Ardisia chiapensis, Schultesia chiapensis, Vincetoxicum? tortum, V. propinquum, Ditassa mexicana, Scutellaria vitifolia, Salvia chiapensis, Bouvardia Purpusii, Guettarda insularis, Borreria radicosa, B. auriculata, B. chiapensis, B. arenicola, B. heterophylla, Diodia pulchella, Marsypianthes arenosa, Conyza chiapensis, Calea Purpusii, Verbesina sylvicola, Perymenium pinetorum, Zinnia Purpusii, Aspilia scabrida,* and *Melanthera fruticosa.*—*W. A. Setchell.*

4846. Camus, A. **Sur les caractèrs et les affinités du genre Pseudovossia A. Camus [The characteristics and affinities of Pseudovossia.]** Bull. Soc. Bot. France 69: 605–607. *13 fig.* 1922.—The author pictures and discusses this previously published genus of the *Rottboellieae* (Gramineae) and contrasts it with *Vossia.*—*P. A. Young.*

4847. Chatenier, Constant. **Plantes nouvelles, rares ou critiques du bassin moyen du Rhône. [New, rare, or critical plants of the middle Rhone basin.]** Bull. Soc. Bot. France 69: 710–718. *1 fig.* 1922.—Descriptions of several species of flowering plants are given, including the following new to science: *Viola rhodanica, Cotoneaster delphinensis,* and *C. amphigena* (*C. delphinensis* × *integerrima*).—*P. A. Young.*

4848. Chermezon, H. **Sur la position systématique du genre Remirea.** [**The systematic position of the genus Remirea.**] Bull. Soc. Bot. France 69: 809–814. 1922.—The author concludes that this member of the Cyperaceae belongs in the group *Rhynchosporeae*, with *Mariscus, Torulinum, Courtoisia etc.*—*P. A. Young.*

4849. Chermezon, H. **Sur quelques Cypéracées nouvelles de Madagascar.** [**Some new species of Cyperaceae from Madagascar.**] Bull. Soc. Bot. France 69: 719–725. 1922.—Descriptions of the following new species are given: *Mariscus Decaryi, Pycreus Bathiei, Bulbostylis andringitrensis, Rhynchospora subquadrata, R. Perrieri, Carpha Perrieri, Costularia purpurea, C. laxa, C. brevifolia, and Hypolytrum nudicaule;* also *H. mauritianum* Nees vars. *contractum* and *testaceum, Mariscus Viguieri* Cherm. var. *contractus*, and *Costularia Baroni* C. B. Clarke var *robusta.*—*P. A. Young.*

4850. Chevalier, Aug. **Sur le Campanula pulloformis Rouy, prétendue espèce endémique de Basse-Normandie.** [**Camapanula pulloformis supposedly endemic in lower Normandy.**] Bull. Soc. Bot. France 69: 788–795. *2 fig.* 1922.—The author shows that this species intergrades with and is really a form of *C. rotundifolia* L. His figures show rounded and lanceolate leaves on the same plants.—*P. A. Young.*

4851. Daveau, J. **Phyllostachys aurea Rivière ii.—Sa fructification.** [**Phyllostachys aurea Rivière ii.—Its fructification.**] Bull. Soc. Bot. France 69: 509–514. *7 fig.* 1922.—The staminate and pistillate characters of this plant are discussed in detail, and an emended and amplified description of the genus is given.—*J. M. Greenman.*

4852. Deane, Walter. **Vaccinium atrococcum, forma leucococcum—A correction.** Rhodora 24: 228. 1922.—This is a correction of name which, through typographical error was originally misspelled. The corrected name is as above.—*M. L. Fernald.*

4853. Eames, A. J., and K. M. Wiegand. **Variations in Trillium cernuum.** Rhodora 25: 189–191. 1923.—Two marked tendencies are noted in *T. cernuum* L.: a small-flowered extreme found chiefly east of the Appalachian system and treated as true *T. cernuum;* and a larger-flowered plant, var. *macranthum* n. var., extending from western New England and eastern Pennsylvania to Saskatchewan and Mackenzie. Since *T. cernuum* var. *macranthum* simulates *T. declinatum* (A. Gray) Gleason, the diagnostic characters of the latter are also stated.—*M. L. Fernald.*

4854. Engler, A. **Eine neue baumartige Dracaena aus dem guineensischen Afrika.** [**A new arborescent Dracaena from the Guinea region in Africa.**] Bot. Jahrb. 59, Beiblatt 131: 19–21. 1924.—A plant collected by Deistel in Buca, Cameroons, came into flower in the Dahlen Botanical Gardens. It is related to *Dracaena arborea* (Willd.) Link. and is proposed as a new species under the name *D. bueana. D. arborea* (Willd.) Link also is discussed, and var. *Baumannii* from Togo is described as new.—*K. M. Wiegand.*

4855. Farwell, O. A. **Corallorrhiza maculata Raf.** Rhodora 25: 31–32. 1923.—The author points out that the combination *C. maculata* var. *flavida* (Peck) Cockerell antedates var. *flavida* (Peck) Bartlett; and that var. *fusca* Bartlett is referable to the earlier var. *intermedia* Farwell.—*M. L Fernald.*

4856. Fernald, M. L. **Empetrum nigrum L., forma purpureum (Raf.), n. comb.** Rhodora 25: 83. 1923.—This form is based upon *E. purpureum* Raf., a plant which has been in doubt. A shrub answering Rafinesque's description is now known from Mt. Fortin, Matane County, Quebec.—*M. L. Fernald.*

4857. Fernald, M. L. **Nomenclatorial transfers in Mariscus.** Rhodora 25: 49–54. 1923.—The author takes up *Mariscus* Zinn (1757) in place of *Cladium* P. Browne (1756, *nomen nudum*), Crantz (1766). The following new combinations and new names occur; *M. aromaticus* (Merrill), *M. boninsimae* (Nakai), *M. borneensis* (C. B. Clarke), *M californicus* (Watson), *M. capillaceus* (Hook. f.), *M. chinensis* (Nees), *M. colpodes* (Lauterb.), *M. complanatus* (Berggr.), *M. delicatulus* n. name (*C. filiforme* Merrill, not *M. filiformis* HBK.), *M. Deplanchei* (Boeckl.), *M. distichus* (C. B. Clarke), *M. ensiger* (Hance), *M. falcatus* (Nees), *M. fallax* n. name (*C. cyperoides* Merrill, not *M. cyperoides* A. Dietr.), *M. ficticius* (Hemsl.), *M. Gaudichaudii* (W. F. Wight), *M. geniculatus* n. name (*C. philippinense* Merrill, not *M. philippensis* Steud.), *M. globiceps* (C. B. Clarke), *M. hirtus* (Boeckl.), *M. Huttoni* (T. Kirk), *M. Maingayi* (C. B. Clarke), *M. mariscoides* (Muhl.) Kuntze f. *congestus* (Fernald), *M. Martii* (Defour),

M. Melleri (Baker), *M. micranthes* (C. B. Clarke), *M. Milnei* (C. B. Clarke), *M. Muelleri* (C. B. Clarke), *M. platyphyllus* n. name (*C. latifolium* Merrill, not *M. latifolius* Schrad.), *M. pantopodus* (Baker), *M. pulcher* (Ridley), *M. restioides* (Sw.) Kuntze var. *effusus* (Griseb.), *M. riparius* (Nees) Kuntze var. *crassus* (Thwaites), *M. samoensis* (C. B. Clarke), *M. Vauthiera* (C. B. Clarke), *M. xiphioides* n. name (*C. Drummondii* C. B. Clarke, not *M. Drummondii* Steud.).—*M. L. Fernald.*

4858. Fernald, M. L. **The American variety of Scheuchzeria palustris.** Rhodora 25: 177–179. 1923.—The American plant has larger follicles, more definite style and larger seed than the European and is set off as *S. palustris* L. var. *americana* n. var.—*M. L. Fernald.*

4859. Fernald, M. L. **The estuarine Bidens of the Miramichi.** Rhodora 25: 43, 44. 1923.—*Bidens hyperborea* Greene var. *arcuans* n. var. is described from New Brunswick.—*M. L. Fernald.*

4860. Fernald, M. L. **The gentian of the tidal shores of the St. Lawrence.** Rhodora 25: 85–89. *Pl. 139.* 1923.—In describing *Gentiana ciliata* of the European Alps Linnaeus included a plant from Canada. The Canadian element of his species has always remained in doubt, since no gentian comparable with *G. ciliata* has been known in Canada. The doubt is now cleared through the discovery by Brothers Marie-Victorin and Rolland of a gentian superficially resembling *G. ciliata*, but differing in many technical characters, on the tidal shores of the St. Lawrence in the region of the city of Quebec. This is described and illustrated as *G. Victorinii* n. sp. A key to the eastern American species of *Gentiana* § *Crassopetalae* is appended. The following are recognized: *G. crinita* Froel., *G. procera* Holm, *G. Victorinii* Fernald, *G. Macounii* Holm, and *G. nesophila* Holm.—*M. L. Fernald.*

4861. Fernald, M. L. **The native tansy of Newfoundland.** Rhodora 25: 13–16, 1923.—*Tanacetum huronense* Nutt. var. *terrae-novae* n. var. is described and the generic status of *Tanacetum* discussed.—*M. L. Fernald.*

4862. Fernald, M. L. **The northern variety of Asperella Hystrix.** Rhodora 24: 229–231. 1922.—The author distinguishes typical *A. Hystrix* (L.) Humb. with glabrous spikelets and ranging from southern Maine to southern Ontario, south to North Carolina and Oklahoma; and var. *Bigeloviana* n. var., with pubescent spikelets and ranging from Nova Scotia and Quebec to Wisconsin.—*M. L. Fernald.*

4863. Fernald, M. L. **The northern variety of Geum virginianum.** Rhodora 25: 98, 99. 1923.—*G. virginianum* L. var. *Murrayanum* n. name (*G. laciniatum* Murr.) is distinguished by glabrous carpels.—*M. L. Fernald.*

4864. Fernald, M. L. **Vaccinium uliginosum and its var. alpinum.** Rhodora 25: 23–25. 1923.—The author recognizes 2 varieties in North America, typical *V. uliginosum* L. (*V. occidentale* Gray) and the arctic-alpine var. *alpinum* Bigel. (var. *mucronatum* Herder.).—*M. L. Fernald.*

4865. Fournier, P. **Le groupe du Veronica agrestis L.** [**The group of V. agrestis.**] Bull. Soc. Bot. France 69: 760–765. 1922.—The author gives a key to a part of the genus *Veronica*, including *V. Tourneforti* Gmel., *V. opaca* Fries, *V. agrestis* L., and *V. polita* Fries. Several varieties are recognized, including *V. opaca* Fries var. *eglandulosa*, *V. agrestis* (L.) Rchb. vars. *Boreana* and *Garckiana*. Discussions of the varieties are given.—*P. A. Young.*

4866. Gagnepain, F. **Euphorbiacées nouvelles (Macaranga).** [**New species of Macaranga in the Euphorbiaceae.**] Bull. Soc. Bot. France 69: 701–706. 1922.—The author describes the following new species of *Macaranga* from Indo-China: *M. adenantha*, *M. Balansae*, *M. kampotensis*, *M. Poilanei*, and *M. Thorelii*.—*P. A. Young.*

4867. Gagnepain, F. **Euphorbiacées nouvelles (Trigonostemon).** [**New species of the Euphorbiaceae in the genus Trigonostemon.**] Bull. Soc. Bot. France 69: 747–755. 1922.—The following new species from Indo-China are described: *T. adenocalyx*, *T. Bonianus*, *T. capitellatus*, *T. cochinchinensis*, *T. Eberhardtii*, *T. flavidus*, *T. Harmandii*, *T. hybridus*, *T. laoticus*, *T. Pierrei*, *T. pinnatus*, *T. Poilanei*, *T. quocensis*, *T. rubescens*, and *T. Thorelii*.—*P. A. Young.*

4868. Gandoger, Michel. **La flore du Beaujolais.** [**The flora of Beaujolais.**] Bull. Soc. Bot. France 69: 795–804. 1922.—The author refers to his herbarium of about 800,000 specimens with which he has an extensive library. The article consists of a long list of species

of plants, mostly flowering plants. He gives amplified descriptions of the following new species: *Cyperus somalicus*, *C. Wilmsii*, and *C. Schlechteri*, incompletely characterized in a previous number of this Bulletin (69: 350. 1922.) (See Bot. Absts. 14, Entry 3057.)—*P. A. Young*.

4869 Комаровым, В. Л., и Достижения. [Komarovym, V. L., and Dostizhenija] **В. области научной работы Отделения. I. Ботаника. Новый род голосемянных Microbiota.** [A new genius of gymnosperms, Microbiota.] Известия Южно-Уссурийского Отделения Русского Географического Общества. [Bull. Southern Ussuri Branch, Russian Geog. Soc.] 1924: 120–123. 1924.—Following the Russian text, Latin diagnoses are given of **Microbiota** n. gen. (*Cupressoideae-Thujopseae*), and of *M. decussata* n. sp., a bush growing in the stone quarries on the southern and western slopes of the Tzamo-Dinsa and Hualaz Mountains.—*Frederick V. Rand*.

4870. Kükenthal, G. **Beiträge zur Cyperaceenflora von Mikronessien.** [Contributions to the cyperaceous flora of Micronesia. Bot. Jahrb. 59: 2–10. 1924. A list is given of the known species and varieties of Cyperaceae in Micronesia. Forty-eight species are included, those preceded by an asterisk having been found for the 1st time on the Ledermann expedition. The following species, varieties, and combinations are proposed as new: *Cyperus cyperoides* (L.) Kük. subsp. *cyperinus* (*Mariscus cyperinus* Vahl), *C. ferax* Rich. var. *Novae-Hannoverae* (*C. Novae Hannoverae* Boeck.), *Fimbristylis annua* (All.) R. & S. var. *pseudoferruginea*, *F. urakasiana*, *F. autumnalis* (L.) R. & S. f. *hemisphaerica*, *Hypolytrum dissiflorum* Steud. var. *oligostachyum* (*H. oligostachyum* Schum. & Laut.), *Thoracostachyum hypolytroides* Clarke var. *immensum*. It is difficult in this paper to make out which are new combinations.—*K. M. Wiegand*.

4871. Kükenthal, G. **Beiträge zur Cyperaceenflora von Papuasien.** [Contributions to the cyperaceous flora of Papuasia.] Bot. Jahrb. 59: 41–60. 1924.—This is an annotated list of the Cyperaceae known to occur in Papuasia, prepared after a study of the rich collections of Schlechter and Ledermann, as well as of other collections. The following species, varieties and combinations are proposed as new: *Cyperus neo-guinensis* (*C. platyphyllus* Ridley, not Roem. & Schult.), *C. pedunculosus* F. Müll. var. *floribundus*, *C. rotundus* L. var. *pseudesculentus*, *C. dilutus* Vahl f. *decolorans*, *Fimbristylis fenestrata*, *F. Schlechteri*, *Schoenus melanostachyus* R. Br. var. *laevinux*, *Thoracostachyum longistylum* and f. *parva*, *Mapania grandiceps*, *M. longirostris*, *M. lactea*, and *M. Ledermannii*. It is difficult to make out from the text what combinations are really new.—*K. M. Wiegand*.

4872. Lauterbach, C. **Die Guttiferen Mikronesiens.** [The Guttiferae of Micronesia.] Bot. Jahrb. 59: 18–23. *Fig. 1*. 1924.—Previously, only 2 species of Guttiferae had been known from Micronesia, though Ledermann had found one other species on the Pelew Islands and another on Ponape. The present list contains 6 species of which *Calophyllum cholobtaches*, *Garcinia ponapensis*, *Pentaphalangium carolinense*, and *P. Volkensii* are described as new.—*K. M. Wiegand*.

4873. Loesener, Th. **Die Aquifoliaceen Papuasiens.** [The Aquifoliaceae of Papuasia. Bot. Jahrb. 59: 80–83. 1924.—Previously, one species, *Ilex soicata* Bl., had been known from this region. Ledermann's and Schlechter's collections have added 3 more species and 2 varieties, as follows: *Ilex Thorelii* Pierre, *I. Ledermannii* n. sp. with vars. *ovalis* and *elliptica*, and *I. Schlechteri* n. sp..—*K. M. Wiegand*.

4874. Markgraf, Fr. **Die Eichen Neu-Guineas.** [The oaks of New Guinea.] Bot. Jahrb. 59: 61–79. *Fig. 1–4*. 1924.—This is really an annotated list of the family Fagaceae. Because of the slow dissemination of the heavy seed of the Fagaceae, the wide distribution of many species among the various islands indicates that they represent ancient types, yet tropical Fagaceae apparently are absent in Australia where many other Papuasian plants occur. Keys to the genera and species are provided. The following species and combinations are proposed as new: *Castanopsis Junghuhnii* (*Quercus Junghuhnii* Miq.), *Lithocarpus solanicarpa*, *L. perclusa*, *L. de Baryana* (*Quercus de Baryana* Wbg.), *L. imperialis* (*Quercus imperialis* Seem.), *L. Lauterbachii* (*Quercus Lauterbachii* Seem.), *L. Schlechteri*, *Pasania aculeata*, *P. papuana* (*Quercus pseudomolucca* Bl. var. *papuana* Wbg.), *P. d'Albertisii* (*Quercus d'Albertisii* F. v. M.), *P. rufo-villosa*, *P. Nymaniana*, *P. Compañoana* (*Quercus Compañoana* Vidal), *P. aspericupula*, and *P. bancana* (*Quercus bancana* Scheff.). Critical notes on relationship and descent within the genera are given.—*K. M. Wiegand*.

4875. Merrill, Elmer D. **New species of plants from Indo-China.** Univ. California Publ. Bot. **10**: 423–430. 1924.—The author lists 15 species collected by A. Petelot, in Indo-China, of which 13 are proposed as new, viz.: *Eremochloa Petelotii, Capparis indochinensis, Glochidion triloculare, Trigonostemon Petelotii, Cleistanthus longipedicellatus, Saurauia Petelotii, Thea Petelotii, Homalium myriandrum, Schefflera Petelotii, Symplocos myriadenia, S. Petelotii, Jasminum longisepalum,* and *Premna acuminatissima.*—*W. A. Setchell.*

4876. Mez, C. **Digitaria marianensis.** Bot. Jahrb. **59**: 1. 1924.—This grass from the Mariana Islands in Micronesia is described as new.—*K. M. Wiegand.*

4877. Nakai, T. **Raphiolepidis et Eriobotryae species sino-japonicae.** Jour. Arnold Arboretum **5**: 61–72. 1924.—The author gives keys to the species and varieties of Eastern Asia of the genera *Raphiolepis* and *Eriobotrya* and cites under the species and varieties an apparently complete citation of literature and synonyms. The following species, varieties, forms, and combinations are new: *Raphiolepis rugosa; R. liukiuensis* (Koidz.); *R. indica* Lindl. var. *typica,* var. *spiralis* (G. Don), var *phaeostemon* (Lindl.) and var. *crataegoides* (Roem.); *R. rubra* Lindl. var. *typica,* var. *foliosa,* var. *lanceolata,* and var. *minor* (Mak.); *Eriobotrya luzoniensis* (Merr.); *E. Henryi; E. acuminatissima* (Merr.); *E. deflexa* Nakai var. *grandiflora* (Rehd. & Wils.); and *Stranvaesia ambigua,* which is a transfer from *Eriobotrya ambigua* Merrill.—*Alfred Rehder.*

4878. Nakai, T. **Some new and noteworthy ligneous plants of Eastern Asia.** Jour. Arnold Arboretum **5**: 72–83. 1924.—Besides the new species and varieties enumerated below the article contains notes on *Smilax japonica* A. Gray (*Smilax trinervula* Miq.), on *Chosenia* for which the author proposes a new subfamily, *Chosenieae,* as distinguished from *Saliceae* with the genera *Salix* and *Populus,* on *Wendlandia Heyneana* Wallich, and an enumeration of the species of *Edgeworthia* with a key. The new species, varieties, and combinations are: *Chosenia eucalyptoides* (F. N. Mey.), *Celtis Leveillei* Nakai var. *heterophylla* (Lév.) and var. *holophylla, Quercus Chenii, Q. fokienensis, Q. Wrightii, Q. glandulifera* Bl. var. *brevipetiolata* (A.DC.) and var. *glanduligera* (Franch.), *Distylium gracile, Osteomeles boninensis* (Decne.), *Prunus incisa* Thunb. var. *gracilis, P. macrophylla* Sieb. & Zucc. var. *sphaerocarpa, Daphniphyllum macropodum* Miq. var. *Lhuysii* (Carr.), *Turpinia ternata, T. gracilis, T. lucida, T. formosana, Meliosma sinensis, Edgeworthia albiflora,* and *Elaeagnus kiusiana.*—*Alfred Rehder.*

4879. Nelson, Aven. **Taxonomic Studies.** Univ. Wyoming Publ. Sci. Bot. **1**: 47–68. 1924.—The author publishes under this title 5 separate short papers dealing with plants of the western United States and Mexico. (1) Phloxes, old and new. The following new species of *Phlox* are published: *P. abdita, P. brevistylis, P. patula, P. planitiarum.* (2) What is Phlox Kelseyi? *Phlox Kelseyi* Britt. and related species are discussed and the author concludes that *P. Kelseyi* should include *P. albomarginata* Jones, *P. alyssifolia* Greene, *P. collina* Rydb. and *P. variabilis* Brand. *P. Kelseyi* var. *minor* is a new combination made by the transfer of *P. albomarginata* var. *minor* Jones to varietal rank under *P. Kelseyi. P. diapensioides* Rydb. is considered as a synonym of this variety. *P. costata* Rydb. is held as a valid species of this group and representative specimens are cited. (3) New genera in the Compositae. **Eremohylema** is proposed as a new genus with *E. sericea* (*Polypappus sericeus* Nutt.) as the only known species. **Calhounia,** n. gen., is made to receive those perennial and suffrutescent plants of Mexico that have been variously referred to the genera *Nocca* and *Lagascea.* The name is given in honor of Mrs. Aven Nelson, née Calhoun, "that through her, as a lineal descendent of John C. Calhoun, a meritorious name in American pioneer history, may be perpetuated in this pioneer Composite shrub." *C. Nelsonae* is described as a new species from Arizona. The following new transfers are made to *Calhounia: C. angustifolia* (*Lagascea angustifolia* DC.), *C. biflora* (*Lagascea biflora* Hemsl.), *C. decipiens* (*Lagascea decipiens* Hemsl.), *C. glandulosa* (*Lagascea glandulosa* Fernald), *C. helianthifolia* (*Noccaea helianthifolia* Cass.), *C. heteropappus* (*Lagascea heteropappus* Hemsl.), *C. Liebmannii* (*Lagascea Liebmannii* Sch.-Bip.), *C. Mocinniana* (*Lagascea Mocinniana* DC.), *C. Palmeri* (*Nocca Palmeri* Robins.), *C. Pringlei* (*Nocca Pringlei* Robins.), *C. Robinsonii, C. rubra* (*Lagascea rubra* Cass.), *C. suaveolens* (*Lagascea suaveolens* HBK.), *C. tomentosa* (*Lagascea tomentosa* Robins. & Greenm.). (4) Actinea. The name *Actinea* is held to replace *Actinella* and include certain west American species treated by some authors as *Tetraneuris.* The following new transfers from *Tet-*

raneuris occur: *Actinea arizonica* (*T. arizonica* Greene), *A. simplex* (*T. simplex* A. Nels.), *A. epunctata* (*T. epunctata* A. Nels.), *A. formosa* (*T. formosa* Greene), *A. angustifolia* (T. *angustifolia* Rydb.), *A. incana* (*T. incana* A. Nels.), *A. eradiata* (*T. eradiata* A. Nels.), *A. acaulis* var. *septentrionalis* (*T. septentrionalis* Rydb.), *A. linearifolia* var. *Dodgei* (*T. linearifolia* var. *Dodgei* Ckll.). *A. Osterhoutii* is described as a new species from Colorado. *Actinella linearis* (*Actinella scaposa* var. *linearis* Nutt.) is a new transfer from *Actinella*. (5) Miscellaneous new species. The following new species are described: *Lewisia aurantiaca*, *Lathyrus Hapemanii*, *Ipomoea futilis*, *Chrysothamnus oliganthus*, *C. zionis*, *Stenotus rudis*, *S. scaber*, and *Aster Eliasii*.—*E. B. Payson.*

4880. Pax, F. **Die Phylogenie der Euphorbiaceae.** [**The phylogeny of the Euphorbiaceae.**] Bot. Jahrb. **59**: 129–182. *Fig. 1–9.* 1924.—In this study of the Euphorbiaceae the following topics, as subheadings, are discussed: (1) Systematic position of the family. The author rejects the claims of relationship to the Salicales, Juglandales, Urticales, Menispermaceae and Parietales. The family is related to the Rhamnales, Sapindales, Geraniales and Malvales, and a diagram showing the relation is given. (2) Subdivisions in the family. The tribes and subtribes are discussed and a polyphyletic origin for some of them is affirmed. (3) The indvidual subtribes. The origin and relationship of each of the many subtribes are discussed. (4) Phenomena of convergence. Not only in floral structure, intensified by the simplification of the flower, but also in some vegetative characters is there a marked resemblance in structure in genera belonging to different tribes and therefore not closely related. A list of over 20 such cases is given and discussed. (5) Historical development of the family. (a) Range. The center of distribution is in the tropics. Central Asia is richer than the Mediterranean region, due to the greater persistence of the Tertiary flora. The present distribution of each tribe is considered. (b) The relation of the various floral regions to each other. This is discussed in great detail, and the evidence supplied by the Euphorbaiceae is noted. In America, the Euphorbiaceous flora of the Galapagos Islands, while largely endemic, indicating the ancient character of the islands, affords some evidence of a possible land bridge to South America but no evidence of a former land connection with the Hawaiian Islands. The distribution of the Euphorbiaceae in North and South America and the West Indies is in agreement with the theory that the Panama land bridge is recent, and that there was formerly a land connection between the West Indies and South America. The paper closes with a bibliography of the family.—*K. M. Wiegand.*

4881. Payson, Edwin Blake. **Miscellaneous papers.** Univ. Wyoming Publ. Sci. Bot. **1**: 69–108. *Fig. 2–6.* 1924.—Five separate short papers are included in the one general title as follows: (1) Scoliaxon: a new genus of Mexican Cruciferae. **Scoliaxon** is proposed as a monotypic genus with *S. mexicanus* (*Cochlearia? mexicana* Wats.) as the only known species. *Lesquerella flexuosa* Brandeg. is found to be synonymous. The species is illustrated by a text figure. (2) Schedin's white-streaked rose: *Rosa nutkana* Presl. var. *Schedinorum* is described as a variety new to science from near Leadville, Colorado. The variety is peculiar in having a conspicuous white line down the middle of each petal. It is interpreted as being a recent mutant from the common native rose of the vicinity. There is appended a short biographical sketch of the discoverer of this rose—the late Nils Tycho Schedin of Leadville, Colorado. (3) Collomia debilis and its relatives: Three species are recognized in this relationship, namely, *C. debilis* (Wats.) Greene, *C. Mazama* Coville and *C. Larsenii* (Gray) Payson. The 1st is found to consist of 5 geographical varieties. The other species are not separable varietally. A dichotomous key is provided for the identification of the various species and varieties; specimens and bibliographical references are cited. *C. debilis* var. *camporum* and *C. Larsenii* are illustrated. The following new varieties and new combinations occur: *C. debilis* var. *Ipomoea*, *C. debilis* var. *camporum*, *C. debilis* var. *integra*, *C. debilis* var. *trifida*, *C. Larsenii* (*Gilia Larseni* Gray). (4) The species of Penstemon native to Wyoming: A key is provided to distinguish the 34 species known to occur within the state of Wyoming. Specimens are cited for each species recognized. *P. Caryi* Pennell is illustrated. The following new varietal transfer occurs: *Penstemon laricifolius* var. *exilifolius* (*P. exilifolius* A. Nels.). (5) Variations in Tetradymia: Three types of variation of subspecific value are described in *Tetradymia*. *Tetradymia permixta* is proposed for a new hybrid between *T.*

Nuttallii and *T. spinosa*. *T. glabrata* f. *calva* is described as a new form from Idaho, Nevada and California. *T. canescens* is considered as being composed of 3 geographical varieties: the var. *typica* from the northwestern United States, the var. *inermis* from the northern Rocky Mountain region and the var. *linearis*, n. comb. (*T. linearis* Rydb.) from the southern and southwestern Rocky Mountain region.—*Author.*

4882. Pellegrin, F[rançois]. **Le Kévasingo ou bois de rose du Gabon. [The Kevasingo or rose wood of Gabon.]** Bull. Soc. Bot. France **69**: 786–788. 1922.—The author discusses the name of this tree and decides that it should be *Copaifera Demeusei* Harms, belonging in the Leguminosae.—*P. A. Young.*

4883. Pellegrin, François. **Notes sur quelques Césalpinées du Congo. [Some species of the Cesalpineae from Congo.]** Bull. Soc. Bot. France **69**: 742–746. 1922.—The author describes the following new species: *Macrolobium ngouniense*, *M. LeTestui*, and *Cynometra nyangensis*.—*P. A. Young.*

4884. Pilger, R. **Convolvulaceae novoguineenses.** Bot. Jahrb. **59**: 84–86. 1924.—The following species are described as new: *Cusenta nuda*, *Erycibe floribunda*, *E. nitidula*, *E. Schlechteri*, and *E. induta*.—*K. M. Wiegand.*

4885. Pilger, R. **Die Santalaceae von Neu-Guinea. [The Santalaceae of New Guinea.]** Bot. Jahrb. **59**: 118–128. 1924.—Special attention is given to the genus *Exocarpus*, with keys and critical notes. Three genera and 20 species are listed in the paper. The following species, varieties, and combinations are proposed as new: *Exocarpus Pullei*, *E. latifolius* R. Br. var. *miniatus* (*E. miniatus* Zippel), *Scleropyrum aurantiacum* (*Scleromelum aurantiacum* Laut. & K. Sch.), *S. leptostachyum*, *Henslowia acutata*, *H. laevis*, *H. Ledermannii*, *H. Schlechteri*, and *H. kaniensis*.—*K. M. Wiegand.*

4886. Rehder, Alfred. **Forsythia viridissima var. koreana.** Jour. Arnold Arboretum **5**: 134–135. 1924.—*Forsythia viridissima* Lindl. var. *koreana* is described as a new variety from Korea.—*Alfred Rehder.*

4887. Rogers, R. S. **Contributions to the orchidaceous flora of Australia.** Trans. and Proc. Roy. Soc. South Australia **47**: 337–341. *Pl. 27.* 1923.—The following species are described as new: *Caladenia cristata* from Western Australia, *C. pectinata* from Western Australia, *Prasophyllum Colemanae* from Victoria, *P. Tadgellianum* from Victoria and New South Wales, *P. lanceolatum* from Western Australia, *P. ellipticum* from Western Australia, *Microtis oblonga* from Victoria and South Australia, *M. truncata* from Western Australia, *Pterostylis decurva* from Victoria, *Drakea Jeanensis* from Western Australia.—*Wm. Randolph Taylor.*

4888. Schellenberg, Gustav. **Die Connaraceen von Borneo. [The Connaraceae of of Borneo.]** Bot. Jahrb. **59**, Beiblatt **131**: 22–41. 1924.—This is an annotated list of the Connaraceae of Borneo compiled after long study of all available material from the island. The position of Borneo between the mainland and the Philippines is noted, as also the fact that it was longer connected with the mainland than was Java. Merrill's explorations in north Borneo have added much to the available material. The following species and combinations are proposed as new: *Taeniochlaena borneensis*, *T. polyneura*, *Hemiandrina villosa* (*Erythrostigma villosum* Zoll.), *H. Woodii* (*Agelaea Woodii* Merr.), *H. insignis*, *H. sarawakensis* (*Agelaea sarawakensis* Merr.), *H. Agamae* (*Aeglaea Agamae* Merr.), *Santaloides ovale*, *S. cordatum*, *S. Beccarii*, *S. Havilandii*, *Connarus lucens*, *C. lunulatus* (*C. grandis* var. *lunulatus* Bl.), *C. Winkleri*, and *C. Jackianus*. Also *Connarus celebicus* is described as new from Celebes; and *C. pentaphyllus* n. comb. (*Cnestes pentaphylla* Spanog.) from Timor is proposed. —*K. M. Wiegand.*

4889. Schellenberg, Gustav. **Eine neue Icacinacee von den Palau-Inseln. [A new species of Icacinaceae from the Pelew Islands.]** Bot. Jahrb. **59**: 17. 1924.—*Urandra elliptica* is described as new.—*K. M. Wiegand.*

4890. Schlechter, R. **Die Scrophulariaceen Papuasiens. [The Scrophulariaceae of Papuasia.]** Bot. Jahrb. **59**: 99–117. 1924.—This is a critical annotated list, with keys, of the species and varieties of the region. Few endemics in this family are found in Papuasia, as of the 26 species listed only 8 are endemic. These 28 species are distributed among 10 genera. The following species, varieties, and combinations are proposed as new: *Limno-*

phila rugosa (*Herpestis rugosa* Roth), *Adenosma papuanum*, *Lindernia pusilla* (*Gratiola pusilla* Willd.), *L. trichotoma* (*Tittmannia trichotoma* Bth.), *Ilysanthes ciliata* (*Gratiola ciliata* König), *I. ruelloides* (*Gratiola ruelloides* König), *Veronica Lendenfeldii* F. v. M. vars. *MacGregorii* and *Giulianettii*, *V. diosmoides*, *Striga Wallichii* (*Buechnera Wallichii* Bth.), and *Euphrasia papuana*.—*K. M. Wiegand.*

4891. Weatherby, C. A. **Some critical plants of Atlantic North America.** Rhodora 25: 17–23. 1923.—*Carex Mitchelliana* M. A. Curtis, a species not generally recognized since its original publication, is revived and credited with a range from Massachusetts to Florida and Alabama. Discussion of its characters is given, as well as a key to it and related carices. *Polygonum densiflorum* Meisn. (*P. portoricense* Bert.) is discussed. *Chelone Grimesii* n. sp. from Virginia and *Gnaphalium obtusifolium* L. var. *micradenium* n. var. from Maine to Virginia, Kentucky, and Michigan are described.—*M. L. Fernald.*

4892. Weatherby, C. A. **The identity of Carex gynandra Schwein.** Rhodora 25: 115, 116. 1923.—The type material is at the Philadelphia Academy, labelled in Schweinitz's hand "Carex gynandra N [obis] Salem, N. C." The material is a mixture of *C. gynandra* as generally understood, *C. crinita* Lam. and *C. Mitchelliana* M. A. Curtis. A specimen sent by Schweinitz to Torrey is *C. gynandra* in the accepted sense; and it is reasonable to retain the name as ordinarily used.—*M. L. Fernald.*

4893. Wiegand, K. M. **Notes on Triosteum perfoliatum and related species.** Rhodora 25: 199–203. 1923.—A study of *Triosteum* is presented in which the author concludes that there are only 2 true species of the genus in eastern America: *T. perfoliatum* L. with 3 varieties, and *T. angustifolium* L. with 1 variety. The following are recognized: *T. perfoliatum*, with var. *aurantiacum* (Bicknell) n. comb., var. *illinoense* n. var., and var. *glaucescens* (Wiegand) n. comb.; and *T. angustifolium* with var. *Eamesii* n. var.—*M. L. Fernald.*

4894. Wilson, Ernest H. **The Rhododendrons of Hupeh.** Jour. Arnold Arboretum 5: 84–107. 1924.—The author gives a general description of the geological and topographic features of Hupeh and discusses the distribution of the 18 species of *Rhododendron* occurring in Hupeh of which 9 are endemic; none of the evergreen *Rhododendron* occurs below an altitude of 3000 feet. The main part of the article consists of a systematic enumeration and description of the species and varieties with notes on their introduction into cultivation and their value as garden plants, preceded by keys to the subgenera sections and species; also the hybrids of these species originated under cultivation are mentioned. The following color forms are described as new: *Rhododendron hypoglaucum* Hemsl. f. *album.*, *R. Fargesii* Franch. f. *album*, *R. discolor* Franch. f. *carneum*, *R. auriculatum* Franch. f. *roseum*, *R. Augustini* Hemsl. f. *violascens* and f. *album*, *R. yanthinum* Bu. & Franch. f. *album*.—*Alfred Rehder.*

4895. Wilson, Ernest H. **The Rhododendrons of Hupeh province, Central China.** Rhododendron Soc. Notes 2: 160–174. 1924.—This is a reprint of: Wilson, E. H. The Rhododendrons of Hupeh. Jour. Arnold Arboretum 5: 84–107, 1924; with the more technical matter, as citation of literature and arrangement of the species under subgenera and sections, omitted. [See preceding entry].—*Alfred Rehder.*

REVISIONS AND MONOGRAPHS

4896. Brackett, A. **Revision of the American species of Hypoxis.** Rhodora 25: 120–147, 151–155. *13 fig.* 1923.—Baker recognized only 3 species of *Hypoxis* in all America, but upon the basis of seed-characters 15 species are now differentiated. The monographic treatment consists of a key, descriptions of species and varieties, and citations of specimens, closing with an index to numbered exsiccatae. The species are all illustrated by habit-sketches and greatly enlarged drawings of the seed. The following are recognized: *H. juncea* Sm., *H. hirsuta* (L.) Coville, *H. hirsuta* var. *leptocarpa* (Engelm. & Gray) n. comb., *H. decumbens* L., *H. decumbens* var. *major* Seubert, *H. rigida* Chapm., *H. tepicensis* n. sp., *H. sessilis* L., *H. breviscapa* HBK., *H. micrantha* Pollard, *H. potosina* n. sp., *H. Wrightii* (Baker) n. comb., *H. rugosperma* n. sp., *H. fibrata* n. sp., *H. humilis* HBK., *H. mexicana* Schultes, and *H. catamarcensis* n. sp.—*M. L. Fernald.*

4897. Cogniaux, A., und H. Harms. **Cucurbitaceae—Cucurbiteae—Cucumerinae.** Pflanzenreich. Heft 88 (IV. 275. ii). *P. 1–246. Fig. 1–26.* Wilhelm Engelmann: Leipzig,

1924.—This is the 2nd part of the Cucurbitaceae, containing in natural sequence the species of the *Cucurbiteae-Cucumerinae*. The genera *Edmondia* (37) to *Adenopus* (61) are considered. In the larger groups and genera dichotomous keys are given. The following new species, varieties, and combinations are included: *Raphanistrocarpus asperifolius* Cogn., Kilimandscharo, East Africa; *Cucumis callosus* (*Bryonia callosa* Rottl.); *C. Cogniauxianus* Dinter, Hereroland, South Africa; *C. angolensis* Hook. f. var. *minor* Cogn., Okanbahe, Southwest Africa; *C. hirsutus* Sond. var. *ovatus* Cogn., Natal; *Hymenosicyos Bequaertii* Harms (*Oreosyce Bequaertii* De Wild.); *Trichomeria Rehmannii* Cogn., Transvaal; *Peponium Laurentii* Cogn. (*Peponia Laurentii* De Wild.); *P. grandiflorum* Cogn. (*P. grandiflora* Cogn.); *P. lagenariodes* Cogn. (*P. lagenarioides* Hook. f.); *P. Cogniauxii* Cogn. (*P. Cogniauxii* Gilg); *P. bracteatum* Cogn. (*P. bracteata* Cogn.) and var. *hirsutum* (Cogn.); *P. chirindense* Cogn. (*P. chirindensis* E. G. Baker); *P. dissectum* Cogn. (*P. dissecta* Cogn.); *P. kilimandscharicum* (Cogn.) Engl. vars. *Holstii* (Cogn.) and *subintegrifolium* (Cogn.); *P. rufo-tomentosum* Cogn. (*P. rufo-tomentosa* Gilg); *P. macrourum* Cogn. (*P. macroura* Gilg); *P. urticoides* Cogn. (*P. urticoides* Gilg); *P. leucanthum* Cogn. (*P. leucantha* Gilg.); *Adenopus Ledermannii* Harms, Kamerun; and *Momordica Gabonii* Cogn. var. *lobata* Harms, Kamerun. Horticultural varieties and forms are included and have been given special consideration by Harms.—*J. C. Th. Uphof.*

4898. Guillaumin, A. **Matériaux pour la flore de la Nouvelle-Caledonie. [Material for the flora of New Caledonia.]** Bull. Soc. Bot. France **69**: 507–509. 1922.—This paper, 15th in the series, presents a revision of the genus *Acianthus*. A key is given to the 13 recognized species. One new species, *A. confusus*, is included.—*P. A. Young.*

4899. Knuth, R[einhard]. **Dioscoreaceae.** Pflanzenreich. Heft. 87 (IV. 43). *P. 1–387. Fig. 1–69.* Wilhelm Engelmann: Leipzig, 1924.—Morphological, anatomical, and biological characteristics are given of the family in general and of the genera and species. *Dioscorea* is credited with 614 species, *Higinbothamia* 1, *Borderea* 1, *Epipetrum* 3, *Rajanea* 24, *Tamus* 4, *Stenomeria* 5, *Trichopus* 1, and *Petermannia* 1. Dichotomous keys are given to the tribes, sections, genera, and species. The following new species, varieties, names, and combinations are included: *Dioscorea adenocarpa* Mart. var. *chartacea* Uline and var. *Balansae* Uline, *D. puncticulata, D. sanpaulensis, D. pichinchensis, D. triangularis* (*D. piperifolia* var. *triangularis* Griseb.), *D. Gibertii, D. Beecheyi, D. Tweediei, D. glomerulata* Hauman var. *Mandonii* (*D. Lorentzii* var. *Mandonii* Uline), *D. delicata, D. permollis, D. piauhyensis, D. cinnamomifolia* Hook. var. *zanonia* Uline (*D. zanonia* Klotzsch), *D. sericea, D. Fendleri, D. pilosiuscula* Bertero var. *panamensis, D. Duchassaingii, D. amoena, D. Humblotii, D. commutata, D. albinervia, D. palidinervia, D. Jamesonii, D. Trailii, D. tenuiphyllum, D. biplicata, D. paraguayensis, D. guanaiensis, D. calcarea, D. stipulosa* Uline, *D. natalensis, D. convolvulacea* Cham. & Schlecht. subspp. *grandifolia* (Schlecht.) Uline and *esurentium* Uline, *D. Purdiei, D. organensis, D. Pellegrini* Hassler, *D. panamensis, D. caldasensis, D. curitybensis, D. Sellowiana* Uline var. *mantiqueirensis, D. praetervisa, D. acutata, D. trifoliata* HBK. var. *amazonica, D. triphylla* L. var. *dumetorum* (*Helmia dumetorum* Kunth), *D. triphylla* L. vars. *abyssinica* and *rotundata, D. Stolzii, D. Engleriana, D. firma, D. rotundifoliolata, D. mengtzeana, D. Tenii, D. subfusca, D. Delavayi* (*D. kamaonensis* var. *Delavayi* Prain), *D. Burkillii* (*D. kamaonensis* var. *Henryi* Prain & Burkill), *D. Mairei, D. pentaphylla* L. var. *unifoliata* Uline, *D. polyphylla, D. echinata, D. globifera, D. excisa, D. Anchietae* Harms, *D. joséensis, D. planistipulosa* Uline, *D. Barclayi, D. Friedrichsthalii, D. aesculifolia, D. coreana* (*D. villosa* var. *coreana* Prain & Burkill), *D. Maximowiczii, D. althaeoides, D. nutans, D. digitaria, D. Buchananii* Benth. var. *ukamensis* Uline, *D. Ledermannii, D. borneensis, D. esculenta* (Lour.) Burkill vars. *spinosa* (*D. spinosa* Roxb.), *fulvido-tomentosa* and *fasciculata* (*D. fasciculata* Roxb.), *D. korrorensis, D. palauensis, D. Raymundii, D. ancachsensis, D. polygonoides* Humb. & Bonpl. var. *martinicensis* (*D. martinicensis* Spreng.), *D. Martiana* Griseb. vars. *pedicellata* and *caudata, D. Quirogae, D. urceolata* Uline var. *reflexa* Greenm., *D. Rosei, D. diamantinensis, D. stellaris, D. fractiflexa, D. potarensis, D. corumbensis, D. sabarensis, D. atrescens, D. dodecaneura* Vell. var. *villosa, D. nigrescens, D. Schimperiana* Hochst. var. *nigrescens* Uline, *D. Dusenii* Uline, *D. japonica* Thunb. var. *Oldhamii* Uline, *D. kelungensis, D. Fauriei, D. futschauensis* Uline, *D. formosana, D. preangeriana* Uline, *D. oxyphylla, D. Wilkesii* Uline, *D. mindanaensis, D. lufensis, D. polyclades* Hook. f. var. *oblongifolia* Uline, *D. glabra* Roxb.

vars. *hastifolia, vera, longifolia* and *tenuifolia, D. siamensis, D. nummularia* Lam. var. *lata, D. opaca, D. angulata, D. glaucoidea, D. Prainiana, D. camphorifolia* Uline, *D. hongkongensis* Uline, *D. augusta, D. laurifolia* Wall. var. *Hookeri, D. Kingii, D. sarawakensis, D. Sarasinii, D. celebesiana* (Uline), *D. Koordersii, D. Milbraedii, D. camerunensis, D. occidentalis, D. toyoensis, D. rotundata* Poir. var. *brevipetiolata, D. hystrix, D. grandibulbosa, D. sublignosa, D. pendula, D. madagascariensis, D. majungensis, D. Giraldii, D. undulata, D. Wichurae, D. Saidae, D. submollis, D. rangunensis, D. Marlothii, D. montana* (Eckl. & Zeyh.) Spreng. vars. *paniculata* (*Testudinaria montana* var. *paniculata* O. Kuntze), *glauca* and *Duemmeri, D. Bangii, D. tauriglossum, D. secunda, D. nuda, D. toldosensis* (*D. violacea* Knuth., not Baudon), *D. bahiensis, D. torticaulis, D. Nurii, D. Harrissii, D. sambiranensis, D. Perrieri; Rajania baracoensis, R. prestoniensis; Stenomeris mindanaensis; Trichopus zeylanicus* Gaertn, vars. *cordatus* (Lindl.), *intermedius* (Lindl.), and *angustifolius* (Lindl.).—*J. C. Th. Uphof.*

FLORISTICS AND PLANT DISTRIBUTION

4900. Allardin. **Dètermination des Saules.** [**Determination of the willows.**] Bull. Mayenne Sci. **1921**: 68–83. 1921.—Three dichotomous keys are given, serving for the determination of the willows of Mayenne and the neighboring Departments, and applicable as well to sterile specimens as to staminate or pistillate material.—*M. Denis.*

4901. Bartlett, George H. **Senecio obovatus var. elongatus in Connecticut.** Rhodora **24**: 226. 1922.—First record is made of the variety in New England. Both discoid and radiate plants are found.—*M. L. Fernald.*

4902. Bertoni, Moisés S. **Graminaceas de las regiones forestales litorales del Alto Parana (Paraguaya, Brasileña y Argentina).** [**Gramineae of the littoral forest region of the upper Parana (Paraguay, Brazil and Argentina).**] Anal. Cien. Paraguayos II, No. 2. *P. 143–166.* 1918.—The author presents an annotated list of more than 100 species and varieties of grasses, including 3 new varieties namely, *Andropogon bicornis* L. var. *paranensis, Paspalum compressum* (Sw.) Rasp. var. *arenarium,* and *Coix lacrima* L. var. *humillima.* Notes are appended on those grasses which are new to Argentina and Paraguay.—*J. M. Greenman.*

4903. Blake, S. F. **Notes on two Ericaceae of the Boston District Flora.** Rhodora **25**: 116. 1923.—*Vaccinium vacillans* Kalm var. *crinitum* Fernald is added to the flora and 2 new stations noted for *Rhododendron nudiflorum* (L.) Torr.—*M. L. Fernald.*

4904. Child, H. W. **A New England occurrence of Listera australis.** Rhodora **24**: 187–188. 1922.—An account is given of the discovery in Vermont by Cyrus Pringle Horsford of this orchid, new to New England.—*M. L. Fernald.*

4905. Fernald, M. L. **Another orchid new to New England.** Rhodora **25**: 47, 48. 1923. —Record is made of the discovery by E. Williams Hervey at South Dartmouth, Massachusetts, of *Habenaria cristata* (Michx.) R. Br., heretofore unrecorded from north of New Jersey. This is an addition to a large group of coastal plain species which are localized about Buzzard's Bay and adjacent sections of Bristol and Plymouth Counties, and the need of intensive work in the region is emphasized.—*M. L. Fernald.*

4906. Fernald, M. L. **Baffin Land plants collected by the MacMillan Expedition, 1922.** Rhodora **25**: 111–114. 1923.—This is a report upon a collection made by Ralph Robinson in southwestern Baffin Land. Several notable range-extensions include: *Salix calcicola* Fernald & Wiegand extended north from Labrador; *Oxytropis arctiloba* Bunge extended eastward from Melville Island and Victoria Land; *Pedicularis capitata* Adams extended south from Ellesmereland and the Boothia Penninsula; *Taraxacum lyratum* (Lebed.) DC. extended south from Ellesmereland and Melville Island.—*M. L. Fernald.*

4907. Fernald, M. L. **Notes on the distribution of Najas in northeastern America.** Rhodora **25**: 105–109. 1923.—A detailed discussion is given of the specific characters and ranges of *N. marina* L., *N. flexilis* (Willd.) Rostk. & Schmidt, *N. guadalupensis* (Spreng.) Morong, and *N. gracillima* (A. Br.) Morong. Morong has stated that *N. flexilis* is common throughout the United States and Mexico and as widely distributed in the Old World. No clearly identifiable specimens of *N. flexilis* have been found by the author from south of Maryland, Ohio, Indiana and Iowa, while to the west of Iowa and Minnesota the species seems to be only in Idaho, Oregon, Washington and southern British Columbia. In the Old

World it is restricted to a few stations in northwestern Europe. *N. guadelupensis* is found to extend from tropical America north to Oregon, Nebraska, Minnesota, in the St. Lawrence system to southwestern Quebec, and to southern New York and southern New England. No basis is found for the record of *N. gracillima* form Missouri. It is a species of the Atlantic slope from southern New Jersey and eastern Pennsylvania to southern Maine.—*Author.*

4908. Fernald, M. L. **Notes on the flora of western Nova Scotia, 1921.** Rhodora 24: 157–164, 165–180, 201–208. 1922.—Records are made of 37 species new to Canada and 25 additional ones new to Nova Scotia, and numerous range-extensons. Critical notes are given on the specific characters or variations of *Potamogeton confervoides* Reichenb., *Juncus militaris* Bigel., *Lophiola americana* (Pursh) Wood, *Betula lutea* Michx. f., *B. caeruleagrandis* Blanchard, *B. caerulea* Blanchard, *Oenothera hybrida* Michx., *Cuscuta Gronovii* Willd., *Plantago lanceolata* L. and *Bidens cernua* L. The following are new: *Juncus militaris* Bigel. f. *subnudus* and f. *bifrons*, *Betula lutea* Michx. f. var. *macrolepis*, *Polygonum hydropiperoides* × *robustius*, *Sarracenia purpurea* L. f. *heterophylla* (Eaton) n. comb., *Rubus odoratus* L. var. *malachophyllus*, *Sabatia Kennedyana* Fernald f. *eucycla*, *Anaphalis margaritacea* (L.) B. & H. f. *anochlora*, *Rudbeckia laciniata* L. var. *gaspereauensis*, and *Hieracium paniculatum* × *scabrum.*—*Author.*

4909. Fernald, M. L. **The Gray Herbarium Expedition to Nova Scotia, 1920. Part I. Journal of the Expedition.** Rhodora 23: 89–111, 130–152, 153–171. *Pl. 130.* 1921.—This is an extended account of a summer's botanical exploration in southwestern and northeastern Nova Scotia, the object of the expedition being to extend the knowledge of the southern coastal plain element in the flora of Nova Scotia. Many extensions of range are recorded, and of the indigenous vascular flora of silicious southwesestern Nova Scotia approximately 150 out of the 800 known species are found to be either isolated from the more continuous coastal plain flora of the South or to be endemic derivatives of it. The life-zones based alone upon temperature are found to be "so tangled that it is doubtful whether a commensurate return can be gained from the effort to untangle them," Louisianian, Carolinian and Hudsonian species being freely intermingled. The coastal plain types are found to be confined to acid areas and consistently wanting in areas of basic soils. There are detailed discussions of the specific characters or the variations of many species: *Botrychium dissectum* Spreng., *Lycopodium inundatum* L., *Zannichellia palustris* L., *Panicum Lindheimeri* Nash, etc., *Agrostis hyemalis* (Walt.) BSP., *Poa costata* Schumach., *Arisaema triphyllum* (L.) Schott, *Juncus subcaudatus* (Engelm.) Coville & Blake, the genus *Lophiola*, *Sisyrinchium arenicola* Bickn., *Habenaria flava* (L.) Gray, *Pogonia ophioglossoides* (L.) Ker, *Amelanchier intermedia* Spach, *Bartonia paniculata* (Michx.) Robinson, *Asclepias incarnata* L., *Utricularia subulata* L., U. *cleistogama* (Gray) Britton, and *U. cornuta* Michx., *Solidago tenuifolia* Pursh, and others; also a discussion of botanical nomenclature. The following new combinations are published: *Scirpus acutus* Muhl. f. *congestus* (Farwell), *Eriophorum Chamissonis* C. A. Meyer f. *albidum* (F. Nylander), *Scirpus atrovirens* Muhl. var. *georgianus* (Harper), *Agalinis neoscotia* (Greene), *Polygonum robustius* (Small), *Habenaria flava* (L.) Spreng. var. *virescens* (Muhl.), *Botrychium dissectum* f. *obliquum* (Muhl.), *Thelypteris palustris* Schmidel f. *suaveolens* (Clute). [For abstract of Part II, see Bot Absts, 12, Entry 4678.]—*Author.*

4910. Fernald, M. L. **The identities of the sand cherries of eastern America.** Rhodora 25: 69–74. 1923.—The author presents the results of a study of the sand cherries, recognizing in eastern North America 3 species: *Prunus pumila* L., an erect narrow-leaved shrub of sands of the Great Lakes region; *P. depressa* Pursh, a prostrate shrub of gravelley or ledgy shores from eastern Quebec to the Mistassini River, and south through northern and western New England and eastern New York to the Delaware; and *P. susquehanae* Willd. (*P. cuneata* Raf.), a broad-leaved upright shrub of dry thickets and barrens from southern Maine to Manitoba, south to Pennsylvania, etc.—*Author.*

4911. Fernald, M. L., and K. M. Wiegand. **Notes on some plants of the Ontario and St. Lawrence basins, New York.** Rhodora 25: 205–214. 1924.—Notes are given on about 60 range-extensions made on a trip by the writers and A. J. Eames from Ithaca to Ogdensburg. *Potamogeton strictifolius* Bennett, *Puccinellia distans* (L.) Parl. var. *tenuis* (Uechtr.) Fernald & Weatherby, *Maianthemum canadensse* Desv. var. *interius* Fernald, *Salix syrticola* Fernald,

Polygonum ramosissimum Michx. and *P. sectaceum* Baldw. are recorded apparently for the 1st time in the state; and *Najas guadalupensis* (Spreng.) Morong, *Alisma Geyeri* Torr., and *Cornus Baileyi* Coult. & Evans from their 2nd stations. The following new names are published: *Jancus balticus* Willd. var. *littoralis* Engelm. f. *dissitiflorus* Engelm. n. f., *Betula papyrifera* Marsh. f. *coriacea* n. f., *Vitis vulpina* L. var. *syrticola* n. var., and *Satureja vulgaris* (L.) Fritsch var. *diminuata* (Simon) n. comb.—*M. L. Fernald.*

4912. Flynn, Nellie F. **Another plant from Nantucket.** Rhodora 24: 241, 242. 1922. —Record is made of the occurrence of the introduced *Cynodon Dactylon* (L.) Pers. on Nantucket Island, Massachusetts.—*M. L. Fernald.*

4913. Gress, E. M. **Falcaria rivini, a plant new to the United States.** Rhodora 25: 12, 13. 1923.—*Falcaria rivini* Host., a deep-rooting umbellifer of Eurasia has appeared in a field in Franklin County, Pennsylvania. It spreads vigorously by long perennial roots and the author believes that, if allowed to spread, it will become a very noxious weed.—*M. L. Fernald.*

4914. Grimes, E. J. **Some interesting plants of the Virginia coastal plain.** Rhodora 24: 148–152. *Pl. 138.* 1922.—These are posthumous notes prepared for publication by Mrs. Grimes. Many species new to Virginia are listed, including *Habenaria repens* Nutt. and *Euphorbia prostrata* Ait., not previously recorded from north of Florida; *Uniola longifolia* Scribn. and *Psilocarya corymbifera* (C. Wright) Benth., heretofore unknown on the Atlantic slope from north of Georgia; *Juncus asper* Engelm., previously considered endemic to southern New Jersey; and numerous species with ranges extended north from North Carolina or south from Pennsylvania or Maryland.—*M. L. Fernald.*

4915. Hanson, H. H. **Leucojum aestivum in Delaware.** Rhodora 24: 144. 1922.—This European species is now thoroughly established near St. Jones' River, Dover.—*M. L. Fernald.*

4916. Harger, E. B., C. B. Graves, E. H. Eames, C. H. Bissell, and C. A. Weatherby. **Additions to the flora of Connecticut, Series 2.** Rhodora 24: 111–121. 1922.—This article consists of an enumeration with notes on 43 species of vascular plants new to Connecticut, and records of range-extensions of 111 others.—*M. L. Fernald.*

4917. Hunnewell, Francis Welles. **A new station for three local Appalachian plants.** Rhodora 25: 168. 1923.—*Trifolium virginicum* Small has been known only from Kate's Mountain, Greenbrier County, West Virginia, growing in company with *Clematis ovata* Pursh. The author, having collected the *Trifolium* on Kate's Mountain, has now found it with the *Clematis* on a slaty hillside at Virginia Hot Springs, Bath County, Virginia. With them at the Hot Springs, *Pseudotaenidia montana* Mackenzie, a 3rd specialty of Kate's Mountain, also occurred.—*M. L. Fernald.*

4918. Hunnewell, Francis Welles. **Salix serissima on Long's Peak.** Rhodora 25: 67, 68. 1923.—Record is made of the discovery of *S. serissima* (Bailey) Fernald on Long's Peak, Colorado, a southern extension in the Rocky Mountains of about 500 miles.—*M. L. Fernald.*

4919. Jenks, Charles W. **Lepachys columnaris in eastern Massachusetts.** Rhodora 25: 68. 1923.—Record is made of the occurrence of *L. columnaris* T. & G. near the railroad at South Billerica, Massachusetts. The seed is supposed to have been brought in baled hay. —*M. L. Fernald.*

4920. Kidder, Nathaniel T. **Carex aestivalis in the Blue Hills.** Rhodora 24:144. 1922.—Record is made of a station in the Blue Hills Reservation, the 2nd station in eastern Massachusetts.—*M. L. Fernald.*

4921. Kidder, Nathaniel T. **Further notes on the plants of Isle au Haut.** Rhodora 25: 147, 148. 1923.—Records of 6 species from Isle au Haut, Maine, are given; 4 of these species are new to the flora of the state, as follows: *Rubus arcuans* Fernald & St. John, *R. multispinus* Blanchard, *Ilex glabra* (L.) Gray, *Bartonia paniculata* (Michx.) Robinson var. *intermedia* Fernald.—*M. L. Fernald.*

4922. Kidder, Nathaniel T. **Isle au Haut plants.** Rhodora 25: 16. 1923.—Record is made of *Luzula campestris* (L.) DC. var. *acadiensis* Fernald and *Solidago lepida* DC. var. *molina* Fernald from Isle au Haut, Maine, the former new to Maine, the latter new to New England.—*M. L. Fernald.*

4923. Knowlton, Clarence H. **Butomus umbellatus on the St. Lawrence River.** Rhodora 25: 220, 221. 1924.—Attention is called anew to the handsome European species which has become naturalized along the St. Lawrence. First reported in 1908 (although collected in 1905), the species has rapidly spread and now stretches from above Montreal to below Quebec, and the suggestion is made that it may make its way into the United States by working up the St. Lawrence and its tributaries to Lake Ontario or Lake Champlain.—*M. L. Fernald.*

4924. Knowlton, Clarence H., and Walter Deane. **Reports on the flora of the Boston District.—xxxv.** Rhodora 24: 92–95; and **xxxvi.** 152–156; **xxxvii.** 231–236. 1922.—Local records are given in report xxxv for the *Umbelliferae* and *Cornaceae*; xxxvi, *Ericaceae;* xxxvii, *Diapensiaceae* to *Asclepiadaceae.—M. L. Fernald.*

4925. Knowlton, Clarence H., and Walter Deane. **Reports on the flora of the Boston District.—xxxviii.** Rhodora 25: 25–31; **xxxix.** 37–43; **xl.** 60–67; **xli.** 185–187. 1923.—Local records are published covering in report xxxviii, the families from *Convolvulaceae* to *Verbenaceae;* xxxix, *Labiatae* with *Perilla frutescens* (L.) Britton var. *crispa* (Benth.) Deane n. comb.; xl, *Solanaceae* and *Scrophulariaceae;* xli, *Lentibulariaceae* to *Plantaginaceae.—M. L. Fernald.*

4926. Lam, H. J. **Die Verbenaceae von Mikronesien.** [The Verbenaceae of Micronesia.] Bot. Jahrb. 59: 24–29. 1924.—This is a list merely of the material in the Berlin Herbarium, studied by the author. Notes, synonymy and lists of stations are given, but no new forms are proposed.—*K. M. Wiegand.*

4927. Lam, H. J. **Verbenaceae der Flora von Papuasien.** [Verbenaceae of the flora of Papuasia.] Bot. Jahrb. 59: 87–98. 1924.—This is an annotated list of the material in the Berlin Herbarium only, and is not necessarily complete. Forty species and numerous varieties are listed. No forms are here described as new. The work is based on an inaugural dissertation by the author.—*K. M. Wiegand.*

4928. Long, Bayard. **Muscari comosum a new introduction found in Philadelphia.** Rhodora 24: 16–20. 1922.—The author gives the history of the discovery and local occurrence, as a wild plant, of the European *M. comosum* (L.) Mill.—*M. L. Fernald.*

4929. Long, Bayard. **Naturalized occurrence of Prunus Padus in America.** Rhodora 25: 169–177. 1923.—The recognition of the Old World Bird Cherry, *Prunus Padus*, as an element in the American flora has rested on specimens collected at Pittsburg, Pennsylvania, in 1900. The species somewhat resembles the American *P. virginiana* and *P. serotina*, but in its larger-flowered extreme has petals so long as to suggest *Amelanchier*. The author gives a detailed statement of his studies, showing that the species is somewhat generally naturalized within a radius of 25 miles of Philadelphia.—*M. L. Fernald.*

4930. Long, C. A. E. **Notable additions to the flora of Knox County, Maine.** Rhodora 24: 181–183. 1922.—Many species new to the region are listed, including *Najas gracillima* (A. Br.) Magnus, *Ruppia maritima* L. var. *obliqua* (Schur) Aschers. & Graebn., *Elodea canadensis* Michx., *Salix pentandra* L., *Rubus Andrewsianus* Blanchard, and *Lonicera Morrowii* Gray; the last mentioned is recorded for the 1st time in the state.—*M. L. Fernald.*

4931. Lownes, Albert E. **Habenaria hyperborea in Rhode Island.** Rhodora 25: 44, 45. 1923.—*Habenaria hyperborea* (L.) R. Br., is recorded as new to Rhode Island; its range is extended considerably in southern New England, at a spot where numerous species of unusual interest occur.—*M. L. Fernald.*

4932. Nelson, J. C. **Introduced species of Lathyrus in the Northwest.** Rhodora 24: 75, 76. 1922.—Records are made of the occurrence in western Oregon of 4 European introductions: *Lathyrus latifolius* L., becoming a pest; *L. Aphaca* L., frequent in cultivated ground and roadsides; *L. hirsutus* L., spreading rapidly in one region; and *L. sphaericus* Retz., as a temporary waif.—*M. L. Fernald.*

4933. Nelson, J. C. **Muscari comosum in Oregon.** Rhodora 24: 208–210. 1922.—*Muscari comosum* (L.) Mill. is recorded as well established in a large field near Waconda, Marion County. The plant sends its bulbs down beyond the reach of plows, to a depth of 30 inches.—*M. L. Fernald.*

4934. Nichols, G. E. **Cercis canadensis in Connecticut.** Rhodora 25: 203, 204. 1923.—*Cercis* was collected by a student on West Rock in the outskirts of New Haven 15 years ago

but it was then supposed to have been picked from a planted tree. In May, 1923, however, the author discovered a colony of good-sized individuals near the summit of West Rock where he has no hesitation in regarding it as indigenous and representing a northeastern extension of the natural range of the species.—*M. L. Fernald.*

4935. Nye, Harriet A. **A new station for Daphne.** Rhodora **25**: 45, 46. 1923.—*Daphne Mezerium* L. is thoroughly established a long roadsides in Smithfield, Maine.—*M. L. Fernald.*

4936. Nye, Harriet A. **A station in Maine for Ilex verticillata, forma chrysocarpa.** Rhodora **25**: 148. 1923.—The yellow-berried form of this species is recorded from Belgrade, Maine.—*M. L. Fernald.*

4937. Parlin, John C. **Waldsteinia in Maine.** Rhodora **24**: 124. 1922.—*Waldesteinia fragarioides* (L.) Tratt., reported from Maine in 1862, but with no substantiating specimens, is now found in an extensive colony at Benton.—*M. L. Fernald.*

4938. Pennell, Francis W. **Scrophulariaceae of the West Gulf States.** Proc. Acad. Nat. Sci. Philadelphia **73**: 459–536. 1921.—The area included is that between the Mississippi and Pecos Rivers in the states of Arkansas, Oklahoma, Louisiana and Texas. Ninety-four species are described and their distribution given. The following new species, varieties, and combinations are made: *Gratiola ramosa* Walt. var. *Drummondii* (*G. Drummondii* Benth.), *G. flava* Leavenworth (*G. pusilla* Torr., not Willd.), *Penstemon Buckleyi*, *P. arkansanus*, *P. arkansanus* var. *pubescens*, *P. Cobaea* Nutt. var. *purpureus*, *P. multicaulis*, *Linaria canadensis* (L.) Dum.-Cours. var. *texana* (*Linaria texana* Scheele), *Afzelia Havardii*, *Aureolaria grandiflora* (Benth.) Pennell var. *serrata* (*Gerardia serrata* Torr.), *A. grandiflora* (Benth.) Pennell var. *cinerea*, *A. flava* (L.) Farwell var. *macrantha*, *A. calycosa* (*Dasystoma calycosa* Mack. & Bush), *Agalinis caddoensis*, *A. edwardsiana*, *A. edwardsiana* var. *glabra*, *A. homalantha*, *A. strictifolia* (*Gerardia strictifolia* Benth.), *A. viridis* (*G. viridis* Small), *A. tenuifolia* (Vahl) Raf. var. *parviflora* (*Gerardia tenuifolia* var. *parviflora* Nutt.), *Castilleja labiata*, *C. citrina*, and *C. latebracteata*.—*L. B. Walker.*

4939. Rogers, R. S. **The distribution of Australian orchids.** Trans. and Proc. Roy. Soc. South Australia. **47**: 322–336. 1923.—The flora is compared with the orchid population of other countries, indicating that it is not rich, having some 450 species compared with 2,205 for New Guinea or 2,000 for Central America. The orchid flora is almost completely limited to the coast because of the aridity of the interior. The relation of the flora in content to other areas is indicated, and also the contents of the floras of the States, which indicates that Queensland is richest in species (209) and the Northern Territory poorest (22).—*Wm. Randolph Taylor.*

4940. Sargent, Francis H. **Euphrasia canadensis in Vermont.** Rhodora **25**: 84. 1923. —Record is made of *E. canadensis* Towns. from Richford, Montgomery and Enosburg in northern Vermont; the species is new to the state.—*M. L. Fernald.*

4941. Schellenberg, Gustav. **Die Connaraceae von Mikronesien.** [**The Connaraceae of Micronesia.**] Bot. Jahrb. **59**: 17. 1924.—One species, *Connarus Gaudichaudii* Planch., is listed.—*K. M. Wiegand.*

4942. Schwertschlager, J. **Die Rosen Bayerns.** [**The roses of Bavaria.**] Bot. Jahrb. **59**, Beiblatt **131**: 1–13. 1924.—In this paper the more important results of an extended study of the roses of Bavaria are given. The publication of the larger paper has been delayed. The larger monograph was based on the author's excursions, and on herbarium material from various sources. The former Kingdom of Bavaria is divided by the author into regions, and these are discussed. The categories employed in classification in the larger paper were: sections, subsections, comprehensive species, subspecies, varieties, forms, subforms and monstrosities. The necessary knowledge is lacking to enable one to recognize in a practical fashion Jordanian species, Mendelian species and pure lines. Varieties are generally distinguished by several characters, forms by 1 character. Varieties often breed true in roses and hence then correspond to Jordanian or Mendelian species. A monstrosity is a form for whose occurrence something other than the usual factors of inheritance and variation is necessary. Crosses are not designated as varieties or forms but as "combinations" or "modifications." "Species" produced by crossing differ from true species. Tackholm has shown how the chromosome complex may give a clue to hybridity. There are about 100 true species

in the genus *Rosa* of which 19 are found in Bavaria. About 500 variations of these occur with about 97 hybrids. The Bavarian species may be grouped in 7 sections. From the rose standpoint Bavaria is divided by the author into 4 geographical regions. Roses had begun to develop and spread in Bavaria as early as the Tertiary. The effect of the ice sheet is discussed, and a picture of the probable history following the Tertiary is given.—*K. M. Wiegand.*

4943. Standley, Paul C. **Trees and shrubs of Mexico.** [Passifloraceae—Scrophulariaceae.] Contrib. U. S. Nation. Herb. **23**: 849–1312. 1924.—This part of the work follows the same lines as the parts previously noticed. Short descriptions of the families, genera, and species are given, with keys, and the vernacular names and uses are treated, often at considerable length. The account of the Passifloraceae is contributed by E. P. Killip, and that of the Cactaceae by N. L. Britton and J. N. Rose. The largest genera are *Neomammillaria* (129 species), *Opuntia* (87), *Salvia* (83), *Solanum* (56), and *Parsonsia* (*Cuphea*) (45). The following new names are included, all by Standley unless otherwise indicated: **Leucopremna** (new genus of Caricaceae), *L. mexicana* (A.DC.), *Jarilla caudaat* (Brandeg.), *Daphnopsis mollis* (Meisn.), *D. Bonplandiana* (Kunth), *Parsonsia racemosa* (L. f.), *P. Gaumeri* (Koehne), *P. ciliata* (Sw.), *P. utriculosa* (Koehne), *P. salicifolia* (S. & C.), *P. epilobüfolia* (Koehne), *P. hyssopifolia* (HBK.), *P. calophylla* (C. & S.), *P. nitidula* (HBK.), *P. cyanea* (DC.), *P. nudicostata* (Hemsl.), *P. empetrifolia* (Rose), *P. pinetorum* (Benth.), *P. chiapensis* (Brandeg.), *P. ixodes* (Hemsl.), *P. Hookeriana* (Walp.), *P. Llavea* (Lex.), *P. Bilimekii* (Koehne), *P. Goldmanii* (Rose), *P. Arnottiana* (*Cuphea bracteata* H. & A., not Lag.), *P. lobophora* (Koehne), *P. squamuligera* (Koehne), *P. aequipetala* (Cav.), *P. bustamenta* (Llave & Lex.), *P. appendiculata* (Benth.), *P. Roseana* (Koehne), *P. megalophylla* (Blake), *P. cristata* (Rose), *P. graciliflora* (Koehne), *P. Boissieriana* (Koehne), *P. micropetala* (HBK.), *P. heteropetala* (Koehne), *P. Schumannii* (Koehne), *P. bracteolosa* (Koehne), *P. Baillonis* (Koehne), *P. heterophylla* (Benth.), *P. jorullensis* (HBK.), *P. intermedia* (Hemsl.), *P. retroscabra* (S. Wats.), *P. Watsoniana* (Koehne), *P. subuligera* (Koehne), *P. Caeciliae* (Koehne), *P. ignea* (A. DC.), *P. Liebmannii* (Koehne), *Calyptranthes euryphylla*, *Myrtus oaxacana*, *M. ledophylla*, *Eugenia Conzattii*, *E. mayana*, *E. sinaloae*, *E. avicenniae*, *E. oaxacana*, *E. inconspicua*, *E. tomentulosa*, *E. Rekoi*, *E. hypargyrea*, *E. Liebmannii*, *E. deltoidea*, *Heterocentron laxiflorum*, *H. alatum* Rose & Standl., *Tibouchina durangensis*, *Miconia madrensis*, *M. tepicana*, *M. Langlassei*, *Oreopanax Langlassei*, *Gilibertia Juergenseni* (Seem.), *Arctostaphylos lucida* (Small), *A. minor* (Small), *A. lanata* (Small), *A. drupacea* (Parry), *Icacorea Karwinskyana* (Mez), *I. Lindenii* (Mez), *I. revoluta* (HBK.), *I. spicigera* (Donn. Sm.)., *I. nigrescens* (Oerst.), *I. pellucida* (Oerst.), *I. pectinata* (Donn. Sm.), *I. crenipetala* (Mez), *I. Liebmannii* (Oerst.), *I. compressa* (HBK.), *Parathesis tenuis*, *P. Rekoi*, *Chrysophyllum mexicanum* Brandeg., *C. tepicense*, *Bumelia Altamiranoi* Rose & Standl., *B. stenosperma*, *Sideroxylon angustifolium*, *Styrax pilosus* (Perkins), *Forestiera durangensis*, *F. rotundifolia* (Brandeg.), *F. chiapensis*, *Strychnos tepicensis*, *Buddleia tomentella*, *Stemmadenia Palmeri* Rose & Standl., *Prestonia Langlassei*, *Echites tuxtlensis*, *Secondatia stans* (A. Gray), *Funastrum heterophyllum* (Engelm.), *F. bicolor* (Decaisne), *F. dumentorum* (Brandeg.), *F. bilobum* (Hook. & Arn.), *Fischeria oaxacana*, *Metastelma Watsonianum* (*M. albiflorum* S. Wats., not Griseb.), *Cynanchum Kunthii* (Decaisne), *C. astephanoides* (A. Gray), *C. sepium* (Decaisne), *Dictyanthus tigrinus* Conzatti & Standl., *Vicentoxicum lutescens* (*Gonolobus luteolus* Decaisne, not *V. luteolum* Jord. & Fourr.), *V. Cavanillesii* (*Cynanchum nigrum* Cav., not *V. nigrum* Moench), *V. stenophyllum* (*G. lanceolatus* Decaisne, not *V. lanceolatum* Kuntze), *V. littorale* (Decaisne), *V. diadematum* (Edwards), *V. tingens* (Decaisne), *V. magnifolium* (Pittier), *V. velutinum* (Schlecht.), *V. suberiferum* (Robinson), *V. congestum* (Decaisne), *V. triflorum* (Mart. & Gal.,) *V. fuscum* (Decaisne), *V. petiolare* (A. Gray), *V. fraternum* (Schlecht.), *V. striatum* (Mart. & Gal.), *V. chrysanthum* (Greenm.), *V. stenopetalum* (A. Gray), *V. asperum* (Decaisne), *V. caudatum* (A. Gray), *V. chloranthum* (Schlecht.), *V. macranthum* (Kunze), *V. oaxacanum* (*G. tristis* Decaisne, not *V. triste* Griseb.), *V. pilosum* (Benth.), *V. Grayanum* (*G. atratus* A. Gray, not *V. atratum* Morr. & Decaisne), *V. calcicola* (Greenm.), *V. cyclophyllum*, *V. barbatum* (HBK.), *V. pectinatum* (Brandeg.), *V. angustilobum* (Rob. & Greenm.), *V. uniflorum* (HBK.), *V. erianthum* (Decaisne), *V. nigrescens* (Schlecht.), *V. nemorosum* (Decaisne), *V. jaliscense* (Rob. & Greenm.), *V. xanthotrichum* (Brandeg.), *Conanthus stenophyllus* (A. Gray), *C. sericeus* (Willd.), *C. flaves-*

cens (Brandeg.), *C. Purpusii* (Brandeg.), *Cordia morelosana, C. urticacea, Bourreria Rekoi, Tournefortia potosina, Heliotropium pueblense, Ghinia euphrasiifolia* (Robinson), *Valerianoides luisanum, V. Nelsonii* (Rob. & Greenm.), *Clinopodium oaxacanum* (Fernald), *C. laevigatum, Hyptis insularis* (Standl. & Goldm.), *Cestrum purpureum* (Lindl.), *Swartzia guttata* (Don), *S. nitida* (Zucc.), *Acnistus macrophyllus* (Benth.), *Bassovia stramoniifolia* (HBK.), *B. escuintlensis* (Coulter), *Leucophyllum Pringlei* (Greenm.), *L. laevigatum, Russelia campechiana.*—*S. F. Blake.*

4944. Svenson, H. K. **Plant notes from Squam Lake, New Hampshire.** Rhodora 25: 183–185. 1923.—Record is made of *Arenaria stricta* Michx. from one of two stations in the state; and several others at or near their northern limits are: *Thelypteris hexagonoptera* (Michx.) Weatherby, *Hemicarpha micrantha* (Vahl) Pax, *Quercus coccinea* Muench., *Anychia canadensis* (L.), BSP., *Arabis viridis* Harger, *Nyssa sylvatica* Marsh., etc. *Gaultheria procumbens* L. f. *elongata* is new.—*M. L. Fernald.*

4945. Szafer, Wladyslaw. **O polskich gatunkach głogu (Crataegus L.).** [**Polish species of Crataegus L.**] Acta Soc. Bot. Poloniae 1: 233–243. *Fig. 20–22.* 1923 [1924].—*Crataegus oxyacantha* (L.) Jacq., *C. monogyna* Jacq., *C. calycina* Peterm. and *C. curvisepala* Lindm. are reported, probably also *C. lagenaria* Fisch. & Mey. apud Ledeb. Three hybrids are also reported.—*C. W. Dodge.*

4946. Szafer, Wladyslaw. **Wisnia w stanie dzikim w Polsce. Wild cherries of Poland.** Acta Soc. Bot. Poloniae 1: 267–269. 1923. [1924].—*Prunus acida* K. Koch is reported as growing without cultivation in Poland.—*C. W. Dodge.*

4947. Wetmore, R. H. **Plants of the Hamilton Inlet and Lake Melville region, Labrador.** Rhodora 25: 4–12. 1923.—Report is given on the vascular plants collected by the author during the Canadian Government Survey of 1921. Collections were made at 20 stations and the report lists 212 species.—*M. L. Fernald.*

MISCELLANEOUS, UNCLASSIFIED PUBLICATIONS

Sam F. Trelease, *Editor*

4948. Anonymous. **Laboratory facilities at Naples, Italy.** Phytopathology 14: 536. 1924.—Any American or Canadian biological worker desiring to use the facilities available at Naples should communicate with B. E. Livingston, Smithsonian Institution Building, Washington, D. C.—*B. B. Higgins.*

4949. Anonymous. **Third Pan-American Scientific Congress postponed.** Phytopathology 14: 535. 1924.

4950. Flynn, Nellie F. **Field meeting of the Vermont Botanical Club.** Rhodora 24: 226, 227. 1922.—A report is given of the summer meeting of 1922.—*M. L. Fernald.*

4951. Grier, N. M. **Preserving Indian pipes without discoloration.** Rhodora 24: 225, 226. 1922.—Methods are described for preserving color in Carnoy's fluid, in 95% alcohol with 10% by volume of concentrated hydrochloric acid, in hydrogen peroxide solution, or in a solution containing zinc chloride, formaldehyde, and glycerin.—*M. L. Fernald.*

4952. Heringa, G. C. **L'usage de la gélatine pour le collage des coupes a congélation.** [**The use of gelatin for gluing sections made by the freezing method.**] Compt. Rend. Soc. Biol. 91: 951. 1924.

4953. Heringa, G. C. **Une nouvelle méthode d'inclusion à la gélatine.** [**A new method of imbedding in gelatin.**] Compt. Rend. Soc. Biol. 91: 671–673. 1924.—The method described is especially good for conjunctive tissue or other tissues in which the modification of the colloids by alcohol is liable to result in a contraction of the tissue.—*Oran Raber.*

4954. Killeffer, D. H. **Chemistry solving Nature's problems.** Amer. Fertilizer 61[8]: 60–64. 1924.—The prediction is made that the chemist may be able in the future to synthesize organic foods economically in the laboratory and thus prevent the extermination of the race by the over-population of the earth, which some extremists fear.—*George H. Dungan.*

4955. Kolkitz, R. **Plankton-Membranfilter.** [**Plankton membrane filter.**] Ber. Deutsch. Bot. Ges. 42: 205–209. 1924.

4956. Lutigneaux, Henry. **Une méthode de reconstitution photographique dans l'espace réel des objets microscopiques: la stéréophotographie.** [A method of photographic reconstruction in space for microscopic objects: stereophotography.] Compt. Rend. Soc. Biol. **91**: 289–291. 1924.

4957. Lutigneaux, Henry. **La sensation de perspective dans les reconstitutions microphotographiques et stéréographiques.** [The sense of perspective in the reconstruction of microphotographs and stereographs.] Compt. Rend. Soc. Biol. **91**: 291–292. 1924.

4958. Monnier, Marcel. **Sur un rhéotome utilisant les propriétés des lampes à trois électrodes.** [A rheotome using the properties of the three electrode lamp.] Compt. Rend. Soc. Biol. **91**: 269–272. *1 fig.* 1924.

4959. Moureau, M., et J. Touchais. **Etudes expérimentales de trois procédés de désinfection des livres souillés par les Bacille tuberculeux.** [Studies on three methods of disinfection of books contaminated by tuberculosis bacilli.] Compt. Rend. Soc. Biol. **91**: 562. 1924.—Sodium fluoride and formalin vapor are both ineffective methods. The best method is by autoclave with steam and formaldehyde at 95° for 1 hour and 20 minutes.—*Oran Raber.*

4960. Murrill, William A. **Sketches of travel in South America. The Botanical Garden in Rio.** Torreya **24**: 91–93. 1924.

4961. Nitzulescu, Virgile, et Constantin Vasilescu. **Sur quelques procédés simplifiés de microphotographie.** [Some simplified methods of microphotography.] Compt. Rend. Soc. Biol. **91**: 763–764. 1924.—Methods are described by which microphotographs may be made with an ordinary camera; these place microphotography within the reach of every laboratory.—*Oran Raber.*

4962. Willis, Lena. **Josselyn Botanical Society.** Rhodora **25**: 99, 100. 1923.—A report is given of the annual field meeting of 1922.—*M. L. Fernald.*